The NATIONAL GEOGRAPHIC MAGAZINE

Vol. XVIII DECEMBER, 1907 No. 12

CONTENTS

Madeira on the Way to Italy. By David Fairchild. With 20 Illustrations.

A Simple Method of Proving that the Earth is Round. By Robert Marshall Brown. Illustrated.

The Modern Alchemist. By Hon. James Wilson, Secretary of Agriculture. Illustrated.

The Uses of Nuts as Food.

American Discoveries in Egypt. Illustrated.

The Truth About the Congo. Illustrated.

Geographical Books of the Year. Illustrated.

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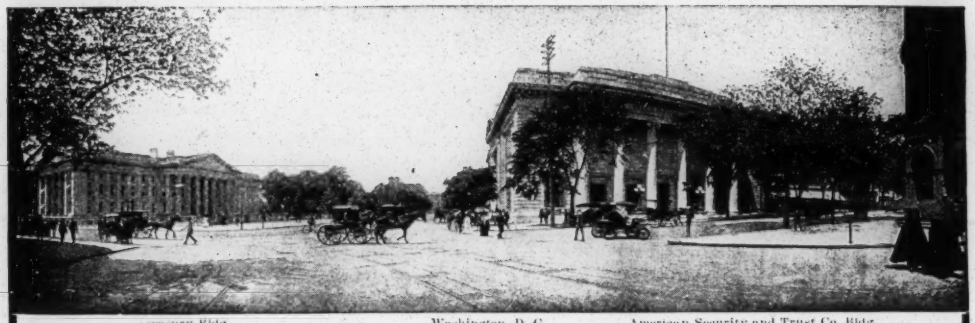

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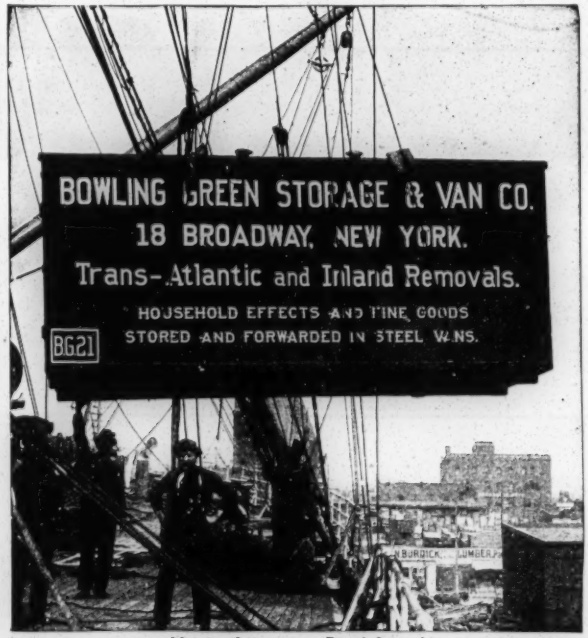
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VOL. XVIII, No. 12 WASHINGTON DECEMBER, 1907

THE NATIONAL GEOGRAPHIC MAGAZINE

MADEIRA, ON THE WAY TO ITALY

BY DAVID FAIRCHILD

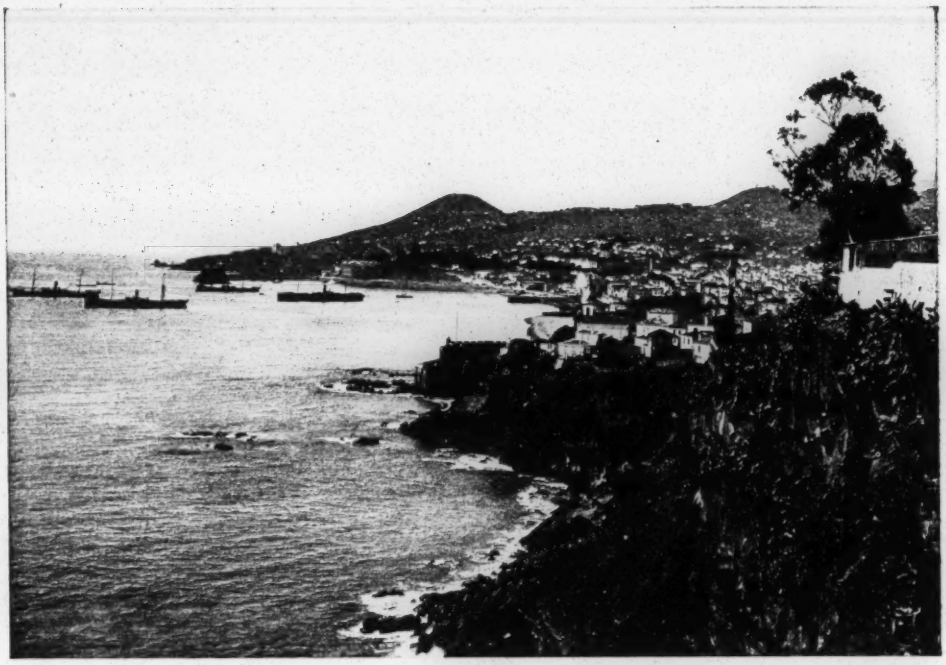
THERE is something about an island in mid-ocean which is attractive, and if it is one of those mere specks on the blue field of a schoolboy's geography, so small that one's boyish wonder is that it was worth naming at all, it is almost irresistible.

There is one such spot of land, little more than twice the size of the District of Columbia, which has on it mountains 6,000 feet high, and which, although discovered before America and so thickly populated that there are 625 inhabitants to the square mile, has deep valleys that have scarcely been explored and inhabitants who have grown to old age without ever owning a looking-glass. On this spot of land the tropical banana and tree fern and the temperate-region oak and sycamore grow in sight of each other, and over every high wall great masses of flowering creepers are in bloom, and in the gardens masses of camellias and all sorts of flowering shrubs are perpetually in flower, frowned down upon by the snow-banks which cover the mountain peaks. This is Madeira, one of the most unique, one of the most beautiful, of all the volcanic mountain peaks that raise their summits above the surface of the ocean.

It is one of the quiet spots of the world and one to which tired souls from our great cities are turning for rest when the gray skies and the piles of sooty snow in the streets make the nervous life of a metropolis unbearable. No wonder it is one of the quietest places in the world, for, although the roads are paved with round beach pebbles, there are no horses shod with iron nor jolting wheels to remind you of the fact. This seems so small a thing to describe that one cannot conceive what a difference the absence of horses and carriages makes to one fresh from the streets of an American city teeming with them.

All vehicles in Madeira are on runners. If you go calling, it is in a bullock sledge, with canopy top and comfortable seats. If you move a bank safe or a steam-boiler, it is carried on a "stone boat" or sledge of poles, and you may have to get forty oxen to pull it. If you are in a villa on the hillside and want to get downtown, you take a running car and slide down over the cobblestones.

A ride in a running car is an experience to be ranked with the initial ride in an auto. You sit down in a comfortably cushioned seat in a low basket on wooden runners and brace yourself for the slide. Two strong men, each holding a guide rope, pull your car over a bag of grease to grease the runners, and then give you a running shove, and jump each on a



The Open Roadstead of Funchal

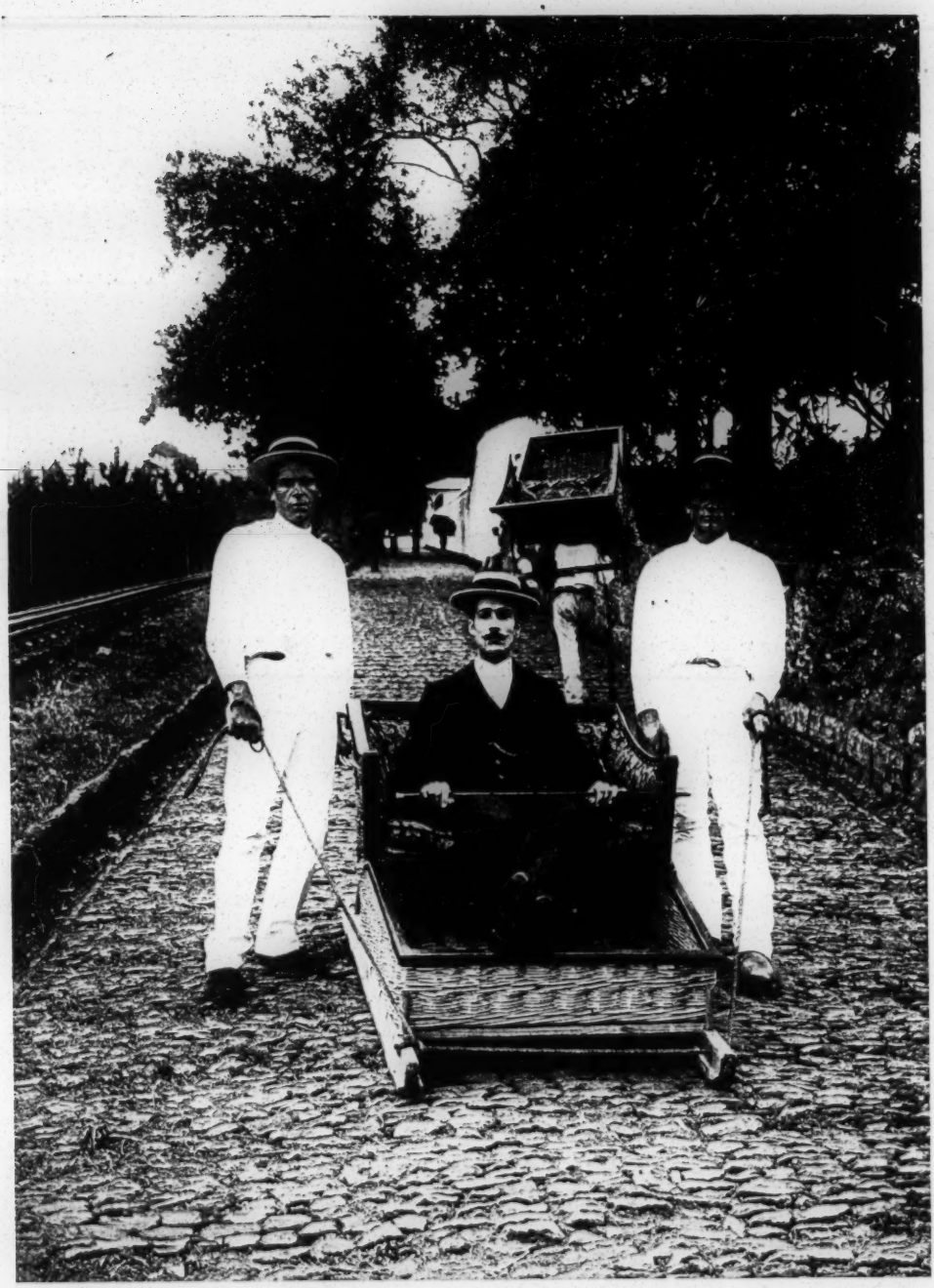
The port of call for steamers from South Africa, South America, Europe, North America, and the Mediterranean. One of the most cosmopolitan anchorages in the world

runner behind, as the car shoots down at break-neck pace over the cobblestones. The men yell, hens and dogs scamper, foot passengers cling close to the wall of the narrow street, the runners get hot and fill the air with odor of burning wood, as you shoot around sharp corners, down the busy thoroughfare, past gorgeous masses of flowering creepers, which hang over the walls of the private villas that border your street.

But oh the change when you get to the bottom! You are obliged either to walk or take a carro, slowest of all slow vehicles, drawn by slow-moving bullocks, squeaking and slipping over the stones, now shoved by main strength of the drivers away from the curb, now jolting over unusually bad bits of cobblestones, until at a snail's pace you reach your destination.

The Portuguese island of Madeira, though lying in the latitude of Charleston, is almost tropical in character. On the seacoast no freezes occur, and all but the ultra-tropical plants grow luxuriantly in the open air with ordinary care. The English residents have amused themselves with their gardens and have introduced a host of things that now add to the beauty of the island. They lay tribute, as it were, on the steamers as they anchor in the little roadstead from all parts of the world, getting from them all sorts of strange plants and animals, and they are sending to remote regions gifts of plants from their collections.

I know of no other place in the world where one can so sit under the shade of his own arbor and watch the steamers as they come and go to all parts of the world. This one weighing anchor for Pernambuco, just as the smoke of a South African cattle-boat is visible on the horizon. New York and San Francisco



The Running Car with Attendants

It is a quick, exciting way to come down, and seems more so after the tiresome bullock sledge ride up the hill. The car is carried up the hill on the shoulders of an attendant

A Steep Grade in Funchal

A cab stand on a corner on one of the steep thoroughfares of Funchal. Running cars for hire to coast down to the town

are of course more cosmopolitan than this, but you cannot appreciate it as you do when your neighbor at the table, a Russian from Odessa, stopping on her way to Rio, is replaced when she leaves by a Boer from the Transvaal on his way to London, and when in order to keep up a general table talk you must resort to three languages at least.

I can imagine no spot on the globe more favorably situated by nature than Madeira for the creation of a truly great private garden, and if there should be among those Americans who read these lines one who wants to see the most beautiful private estate in the world, he will find it, I believe, in the historic Palheiro, now the property of Mr. John B. Blandy, who belongs to one of the oldest of the many English families on the island. Twice, at long intervals, I have had the privilege of visiting Palheiro, and both times its charm and its remarkable variety of landscape and its incredible profusion of flowers have astonished me.

It does not lose its beauty even by comparison with the villas of southern and central Italy, or with the far-famed Cintra of Portugal. When you see an English manor-house commanding from an altitude of 2,000 feet a superb view of green mountain-side with the sea at its feet, a great avenue of sycamores, beautifully kept lawn, hedge rows, great masses of climbing roses, beds of violets, strawberry gardens, and English oaks, you are convinced that you are in England in June; but double rows of immense camellias covered with blossoms, giant acacias with their masses of pure gold flowers, groves of oranges and

The Carro of Madeira

Practically the only vehicle which can be drawn over the steep cobblestone roads of the island

lemons, convince you that you are in Italy, and its exquisite valley of tree ferns makes you sure that you must be in New Zealand, Hawaii, or one of the East Indian islands.

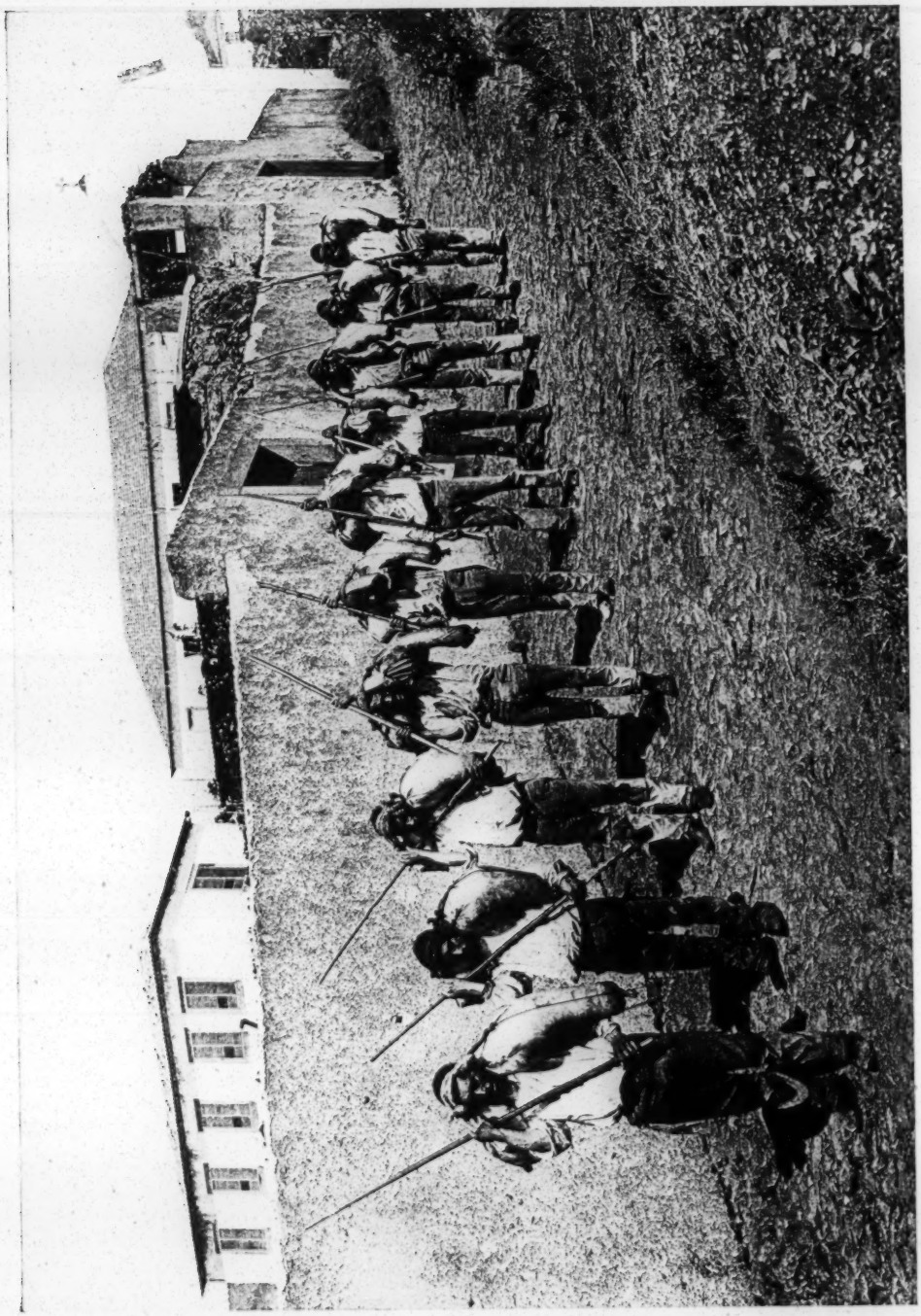
Summer, it is said, is the time to visit this wonderful place, and it is a pity that a misconception of the climate of the island prevents Americans from spending this season there, but even in winter, when the dispatches from home were telling of blockades of snow and interrupted traffic, we found Palheiro a dream of landscape beauty, and took away with us 26 kinds of flowers.

There are few places that give a greater perspective on our rushing, bustling civilization than this Portuguese island in the Atlantic, or which show more clearly the inevitable results of bad management from a political point of view. Did not every intelligent man one meets in Madeira criticise the government policy there might be reasons for not saying harsh things about it, but, as it is the constant talk of those who are borne down under it and suffer from it, there is no reason why American visitors who spend, as most of them do, only a day or two on the island should not understand some of the reasons why its people are so poor as a class, why illiteracy is so prevalent among them, and why this seeming paradise of beautiful and fruitful things is anything but ideal for those forced to live there and earn their living on it.

How is it possible that 150,000 people, who get their living from cultivating the soil, should keep abreast of the times when there is not a single industrial or agricultural school among them, and when the complaint common among those who send their children to the religious

Funchal, the One City of Madeira

Seen from the west, with the peak fort in the foreground and the snow-covered peaks behind

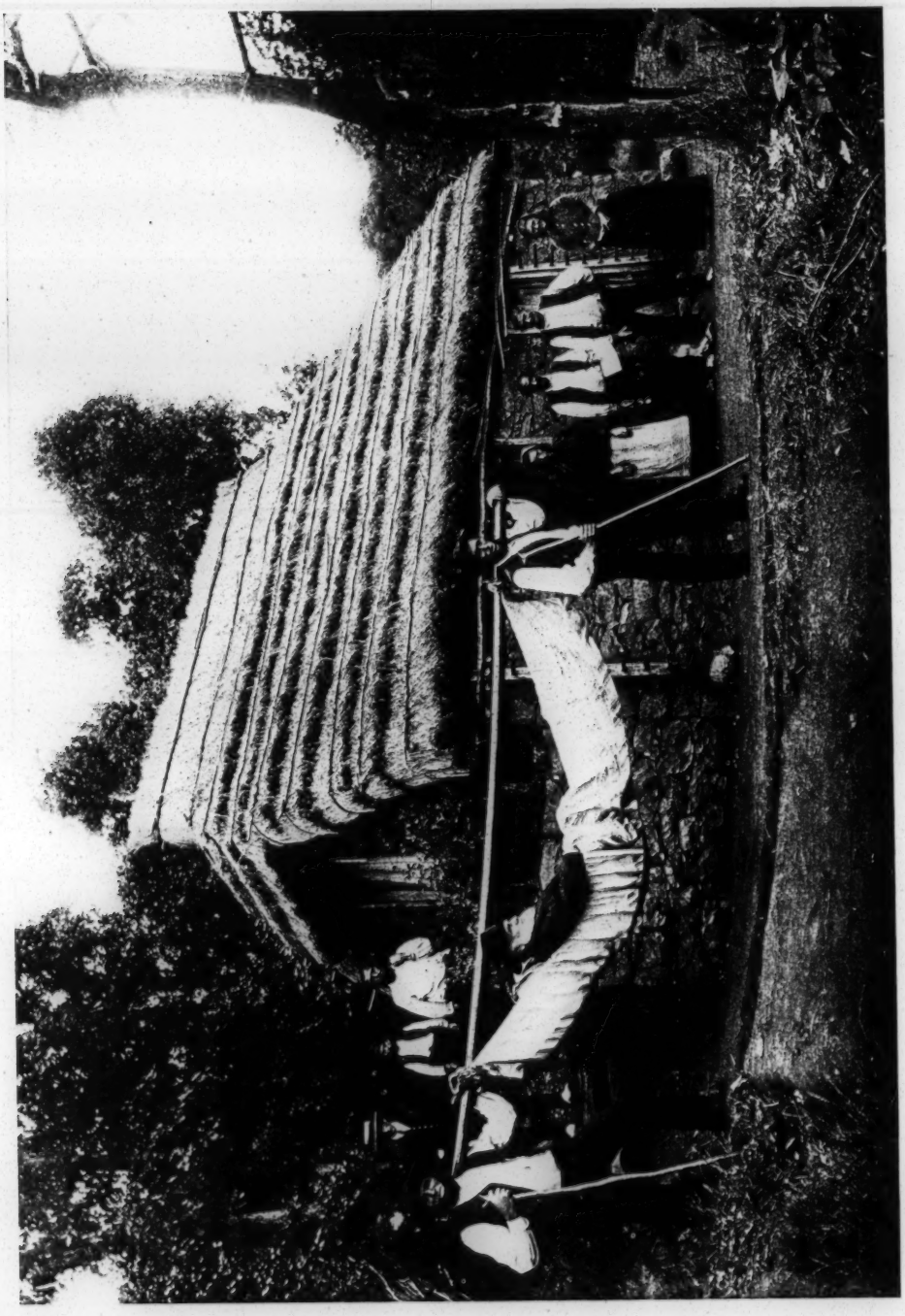


The New Madeira

Wine being carried in skins to the wine-cellars of Funchal

Scenery in the Grand Curral

Almost unexplored and inaccessible mountain valley of volcanic origin, whose sides are clothed with luxuriant semi-tropical vegetation at the bottom and with temperate region plants at the top



A Visitor to a Mountain Mission Station

One must either walk or be carried in a hammock over the steep mountain trails of the island

Madeirans in Gala Dress

These costumes are now rarely seen except in the western parishes

Photo from David Fairchild, U. S. Dep't of Agriculture

Madeiran Children

Wine Press Still in Use on the Island

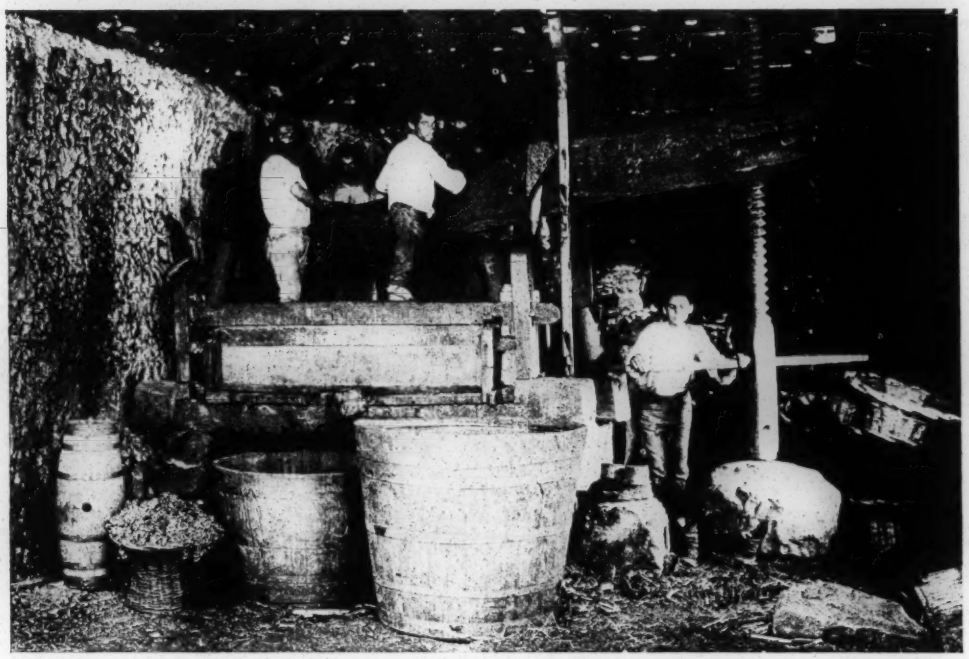
schools of the country is that the children are only taught how to sing?

China has at the present time in this country over 120 government students, who are being educated at our agricultural and technical schools. Japan has long ago established her schools of agriculture and her experiment stations on a comprehensive scale, but Madeira remains still in a condition of apathy toward these fundamental things, which is truly appalling, and I predict that in ten years' time, unless she undergoes a revolution in this regard, she will be farther behind in the race than China is today.

How is it possible for a colony to prosper if its policies are directed on the mainland and subject to the political mix-ups of the mother country, which is interested only in the revenues she can get out of the impossible import duties she imposes?

Protection, designed in America to assist new industries until they get on their feet, has been resorted to by the Portuguese to keep alive such agricultural industries as should long ago have migrated to countries of cheap land and machine labor. If the government finances had been spent in exploiting the resources of the country by the introduction of crops that would pay, or in encouraging the cultivation of the delicious fruits and vegetables such as are already grown, a market could readily be formed in Europe and America, and this wonderful island would be rich instead of poor, and would have a host of agricultural monopolies instead of the one (Madeira wine), which has apparently seen its best days.

That new industries can be built up and thrive is perfectly evident from the start that has been made, mainly through the efforts of a few men, in the embroidery business. So profitable has this industry become that missionaries in the interior



Where the "Old Madeira" Begins

A wine press of the old primitive type

of the island informed us that the housewives neglected their homes, injured their health, and ruined their eyesight in order to make the beautiful embroidery which every female tourist takes away with her. One firm, the Madeira House, sold $1,200 worth to one steamer load of Americans alone in a single day. Another dealer showed the writer a cablegram from the son of the governor of Para, who was just leaving Brazil for Paris, ordering $720 worth of embroidered petticoats.

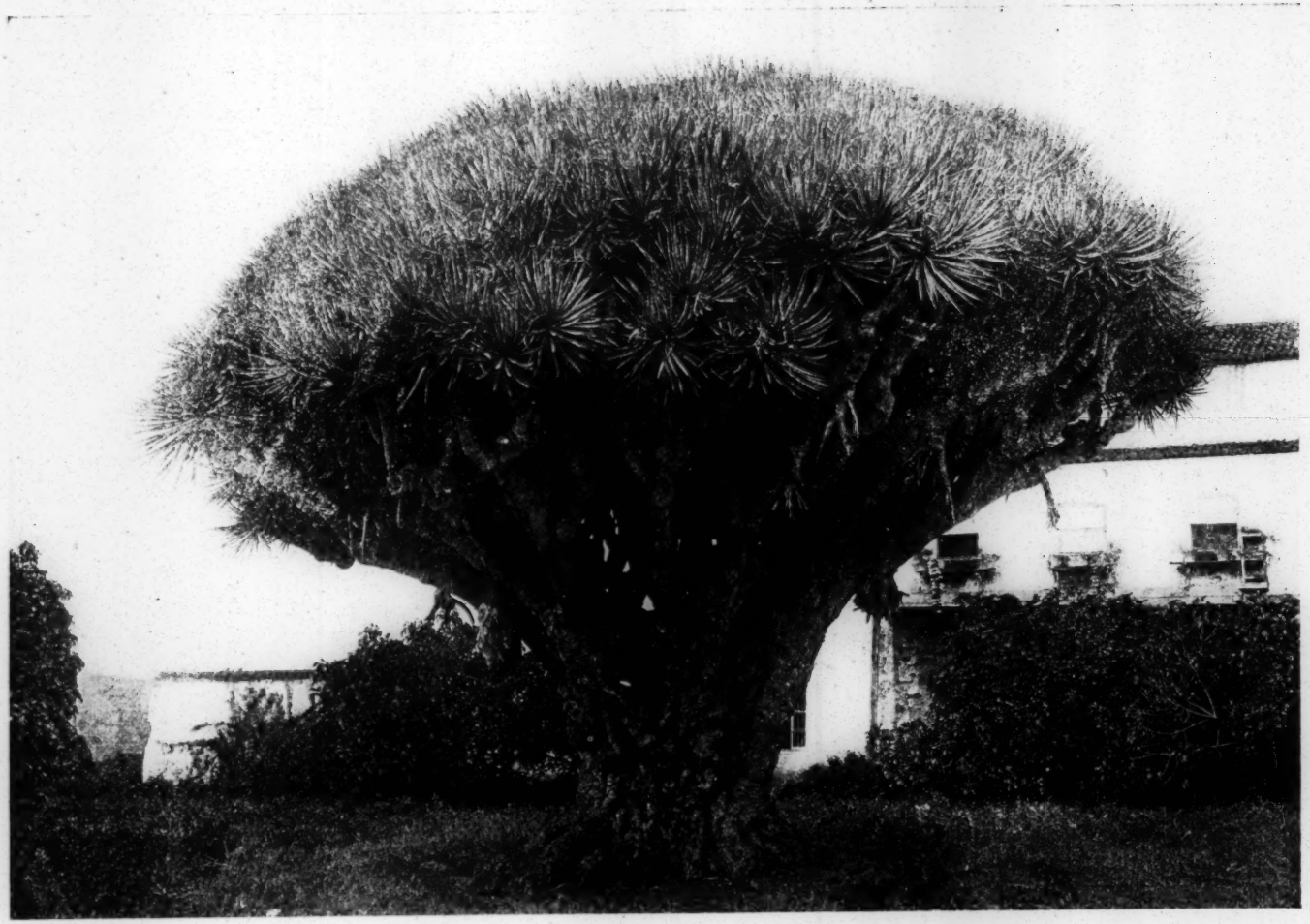
In the old days, when Madeira wine was all the fashion and American clippers carried it around the Horn and back again to age it, the island prospered, and English firms made fortunes in a hurry. The island has a monopoly, an agricultural monopoly, such as France has in her truffles and her Bordeaux. Nowhere else in the world could the same wine be produced, and the wealthy of the great cities demanded it at any price. Times have changed, and doctors say that Madeira is bad for gout. The demand has decreased, fraudulent adulterated "Madeiras" have been illegally put on the world markets, and the vineyards still stand, but no great fortunes are now made in the wine business of the island.

For one who wants sight-seeing and things to do, Madeira is not the place to go. You cannot expect that thirty miles of mountainous country, so steep that horses cannot be used on it and over which you must either walk or be carried in canvas hammocks, will be the place to taken an automobile or have anything more exciting about it than is furnished by dangerous landing places on the coast or precipitous cliffs and ravines of volcanic rock; but there is a class of people to whom the wonderful scenery does appeal, who revel in the sunshine, the colors, the odors of the flowers, the quaint roadside scenes, and who are in-

The Grapes from which "The Old Madeira" is Made

Sledding a Load of Sugar-cane to Mill

All heavy loads are transported on narrow sleds drawn by oxen over cobblestone roads



Dragon Tree of the Island a Century Old

Some of these trees rival the redwoods in age, and on the island of Teneriffe a famous one was recently blown down which must have been a seed before the birth of Christ

Cutting the Cane on one of the Terraced Miniature Sugar-cane Plantations

A Rest on the Way Home from the Spring

A Basket of Anonas on the Way to the Fruit Market

This fruit is one of the delicacies for which the island is renowned

A Typical Coast Village at the Foot of Precipitous Cliffs that are Terraced with Plantations to Their Top

Peasant Girls in the Interior Carrying Sweet Potatoes to Market

terested in the terraced hillsides, populated by simple peasants, living in thatched cabins. There are valleys thousands of feet deep, which are terraced to their summits in a manner quite as wonderful as anything you will see in Java or Japan. We Americans have not yet reached the stage where we must terrace and contour our hills, and it is a very useful thing to see how the almost perpendicular hillsides of this little island are all made to bear the crops which support human life, for it gives one a good idea of the margin of possible unoccupied land that still exists in America.

The problem that the Portuguese inhabitants of this colony have had to face is how to support on an island of 240 square miles, a great deal of which is in the air, so to speak, and absolutely untillable, a rapidly growing population, now numbering 150,000, or 625 to every

square mile. They have done it in one way, and, I suppose, the only way possible, a few generations ago, but if today this island were to be discovered anew, absolutely without human inhabitants, as it was originally, and it were left to Americans to populate it, the problem would be handled in quite another fashion.

By brute force and hand labor they have tried to do it, and, though the water-courses develop thousands of electric horse-power, they do not use it as they could to run their mills nor to encircle the island with an electric railway. They prefer that it shall cost more to bring a load of timber from a few miles in the interior than to bring it all the way from Norway, and in this, perhaps, they are no worse than Americans, with their short-sighted policy of poor country roads. But their terraces are marvels of industry, and one stands amazed before them as before the giant ant-hills of Africa or the Indies.

Little by little, just as the ant-hills are made, these terraces are fastened to the cliffs by a race of physically overworked people, who are happy in a religion that keeps them in the grossest ignorance and in those physical pleasures that are common to the savage and the civilized alike. Instead of growing in intelligence, these emigrants—hybrids of Moorish and European immigration—have been forced by the pressure of a hard day-by-day struggle for mere food and fire to lower and lower levels, until today they are on a plane with some of the so-called savage races, as far as their food habits are concerned, though, of course, far above these in their instinct of labor. The island is now so overpopulated that the young men are getting away to Hawaii and the Argentine, where money is to be made. In a sense, Madeira is becoming an admirable place for the creation of cheap but industrious field labor. In a single steamer over 1,000 of these field hands left for Hawaii to work in the sugar estates there.

If there were adequate provision for educating these peasant's sons, it would be hard to find conditions more likely to instill into them the instinct of industry and at the same time develop good, strong bodies than those furnished by the simple mountain life of the peasant of Madeira.

A SIMPLE METHOD OF PROVING THAT THE EARTH IS ROUND

By Robert Marshall Brown

State Normal School, Worcester, Massachusetts

My attention was directed a year or so ago by Prof. W. M. Davis to certain experiments on the curvature of the earth performed by Mr H. Yule Oldham, of King's College, Cambridge, England, on the old "Bedford Level." It was suggested to me at the time that Lake Quinsigamond offered exceptional advantages for the repetition of these experiments. I have not been able to find Mr Oldham's report on his experiments, and such references to them as I have seen have not furnished me with any idea of the methods pursued by him. In one sense, then, my experiment is not a repetition. The object was the same, the methods were in the main similar, but the apparatus probably differed.

Nearly every one is familiar with the proof of earth sphericity deduced from the disappearance of a ship at sea. This proof, in part because of its submittance to simple diagrammatic representation on a blackboard or on paper and the sim-

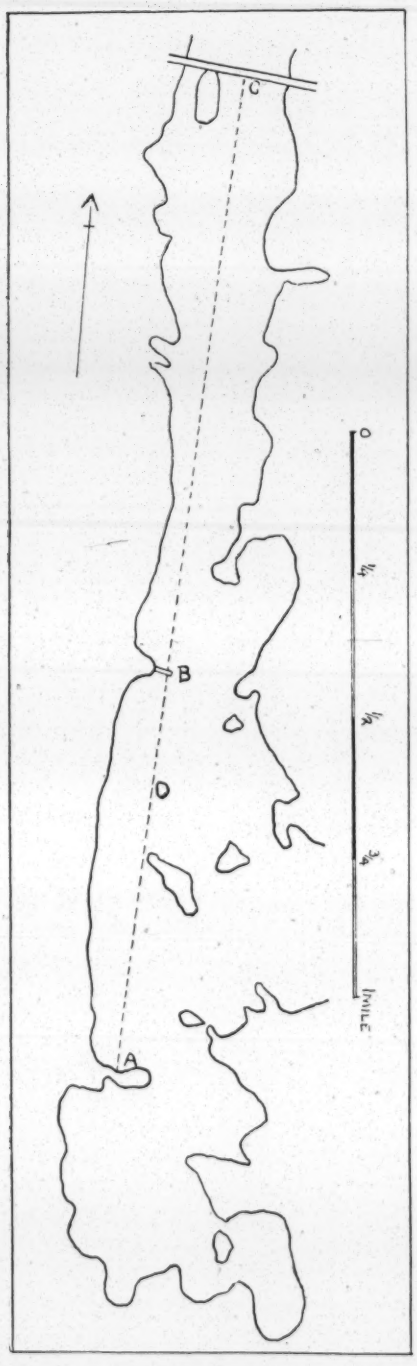


Figure 1

plicity of the illustration on a globe, has gained precedence over others even in a land where but a small percentage of the people at school ever have a chance to experience the real demonstration. To those who have the opportunity to observe for themselves this phenomenon, the unaided eye does not on most occasions yield very satisfactory results.

The experiment which forms the theme of this paper is of a nature similar to the ship-at-sea proof of rotundity of the earth and differs most in the limits of the range. The writer makes no claim to originality as far as the fundamental proposition is concerned. It has been mentioned, more from a theoretical standpoint, however, in books on astronomy and geography for years. He desires to show how simply the experiment may be performed in regions where the proper conditions prevail. It may be done wherever a level of a mile or more is to be obtained. The first choice in locality falls on an inland lake, apart from tides and swells, where on a calm day a level and unchanging surface is available. It is necessary to have three stations, one intermediate in position, so that a salient or an island is a requirement. This same experiment may be done upon a reasonably level area by erecting rods whose heights are carefully determined by a surveyor's leveling instrument.

Lake Quinsigamond, the field of the experiment, is about 5½ miles long and from one-eighth to one-half mile in width. It is situated along the eastern boundary of Worcester, Mass. The lake, like most New England lakes, is the resultant of the blocking of drainage by the deposit of glacial drift. Many islands break the water surface, and the shore line is somewhat irregular. Figure 1 is a map of a portion of the southern end of the lake. At A, a board two feet square, mounted on an ordinary chart standard, was located. The board was divided vertically into two parts. The upper part was covered with black paper. This yielded a distinct horizontal line at the boundary of the paper and the board.

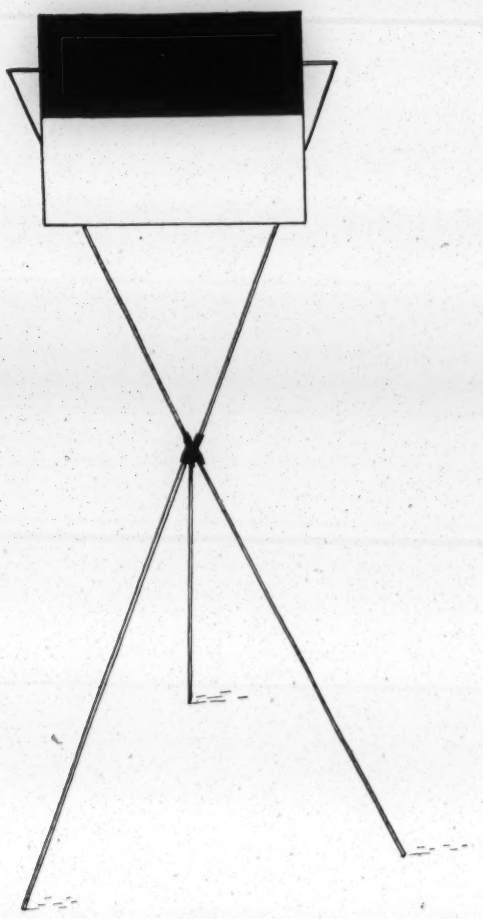


Figure 2

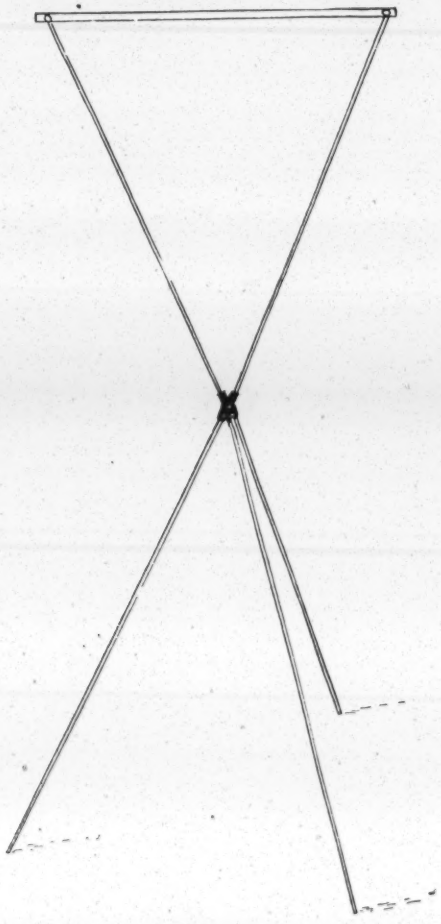


Figure 3

In setting up this apparatus the legs of the standard were driven into the gravel at the water's edge, the board being over the surface of the water. Plumb lines were dropped from the ends of the horizontal line, and both ends were placed at the same height above the water surface (in this case, four feet two and one-half inches). Figure 2 is an illustration of this apparatus.

At B (figure 1), near a wharf which extends into the lake, a bar was erected. This bar (figure 3) was also mounted on a chart standard. It was set up in such a way that it was parallel to the horizontal line of the first piece of apparatus, and it was made level by dropping plumb lines from the ends of the bar. The bar was covered with white paper. It was an inch in diameter, and its center was placed four feet two and one-half inches above the surface of the lake. At C a telescope was mounted on a third standard. The telescope was a two-inch glass, and it magnified about twenty-five diameters. The axis of the telescope was placed at four feet two and one-half inches above the water surface. The horizontal line of the apparatus at A, the middle of the bar at B, and the axial line of the telescope at the point of support were at the same distance above the

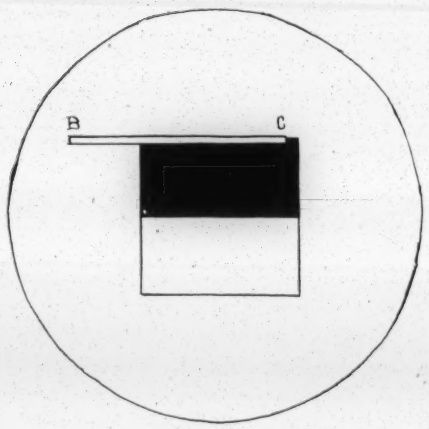


Figure 4

water of the lake. In sighting (C to A on map) at the horizontal line of the standard placed at A, the bar appeared in the field of view projected on the board. The bar did not coincide with the horizontal line, but appeared at the top of the black surface of the board. The view through the telescope is sketched in figure 4. This upheld the expectation with which the experimenter went into the field. The explanation is so obvious as not to need a long dissertation. Reference to figure 5, which represents a cross-section of a portion of the earth, may be helpful. The points A′, B′, and C′, which were equally distant above the water surface, may be considered as equal extensions of three radii; the circumference through A′, B′, and C′ is concentric to the earth's circumference. The chord A′–C′ must intersect the extended radius BB′. The chord A′–B′, extended, will pass out of the circle and cut a still farther extension of CC′ at C″.

In order to check the experiment another standard similar to the one pictured in figure 2 was erected at C. The horizontal line was placed at four feet two and one-half inches above the water surface. A return was then made to A. The bar at B was inspected and its height measured again, and no change had taken place in its position. At A the height of the horizontal line was measured again, and showed no disturbance. From A, a sighting was made on the board at C. The bar again appeared in the field of vision, and again it was projected against the top of the black paper on the board. In returning to A, I had reached the conclusion that inasmuch as the distance B-C, 5,660 feet, was greater than the distance A–B, 3,740 feet, the displacement of the bar as seen from A projected on the board at C would be greater than the displacement on the board at A as seen from C. To find the bar projected against relatively the same positions suggested an error in my measurements. Each piece of apparatus was measured again, and found to have been at the desired distance above the water. My difficulty was removed on measuring the boards. The black surface of the board placed at C was twelve inches high, while that at A was ten and one-half inches.

No attempt was made at quantitative work. It is the plan to obtain data for finding the size of the earth. New stations will be selected, and the position of the bar will be located more nearly half way between the terminal points.

The writer commends a trial of this experiment, wherever conditions permit, to a teacher for a class exercise or to any individual for his own enjoyment. It is simple and it is convincing.

Figure 5

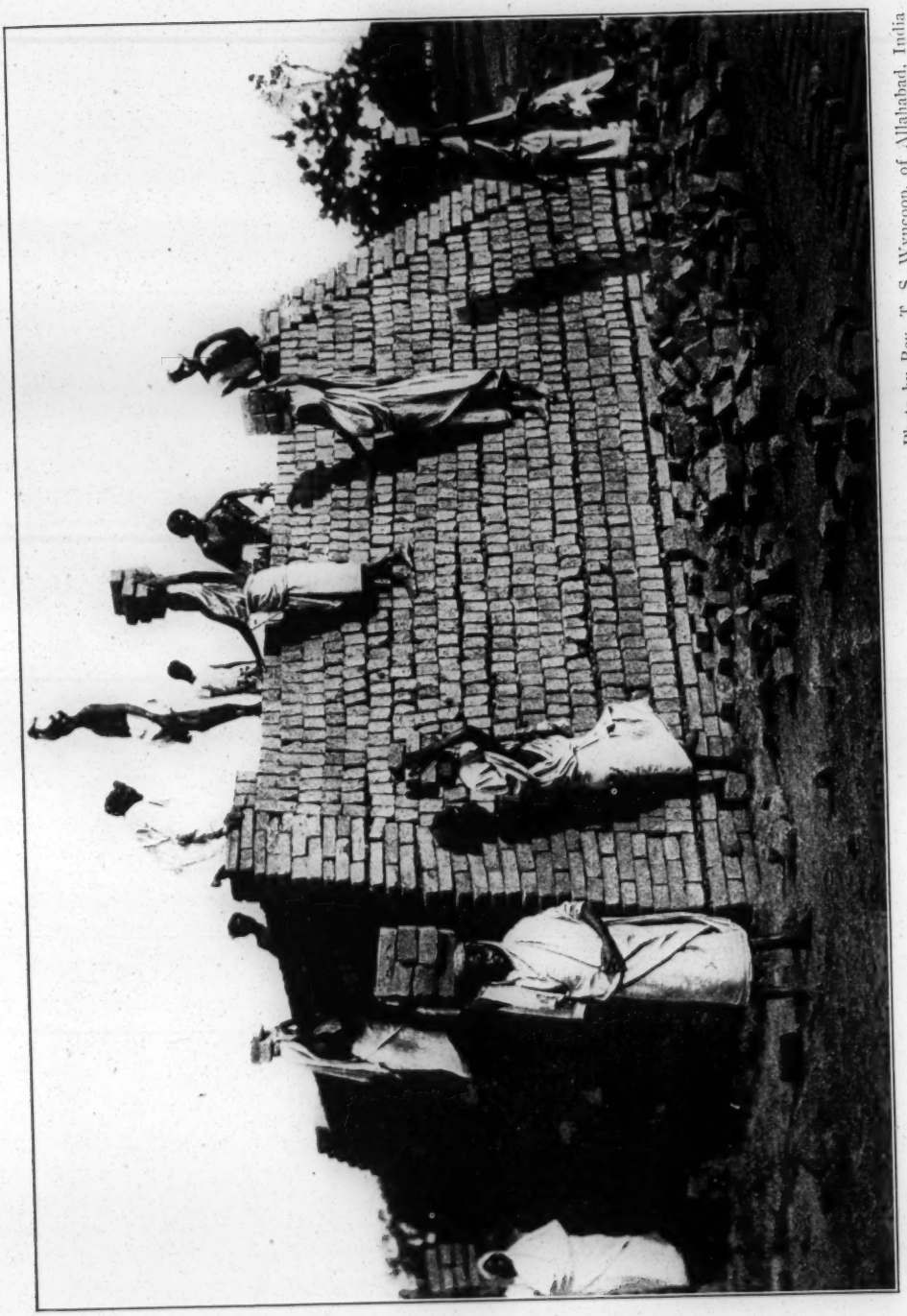


Photo by Rev. T. S. Wynoop, of Allahabad, India

Piling Sunbaked Bricks in India

The wages of these women are 3 cents a day and their hours from sunrise to sunset

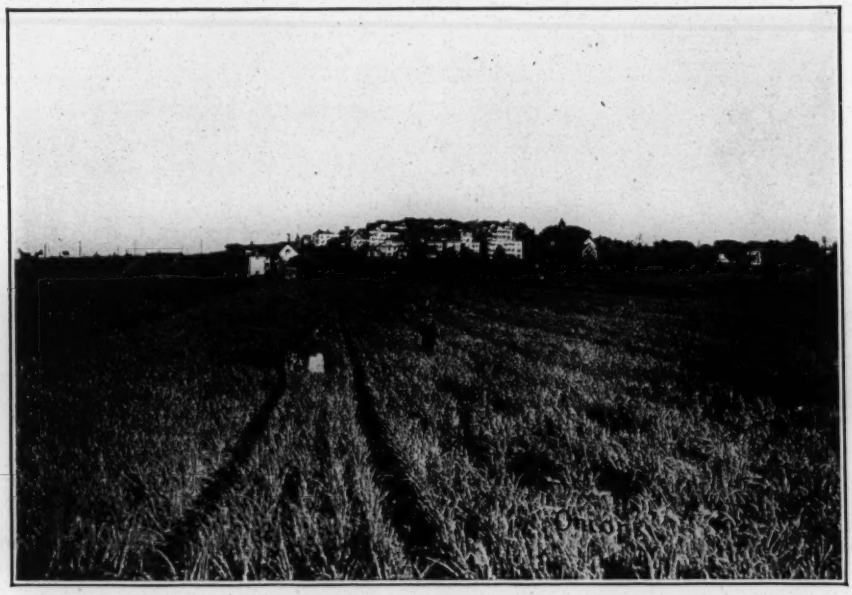
Photo by John A. Fleming, Carnegie Institution

Indian Woman and Child of Guatemala

The picture is particularly faithful in showing the patterns of cloth made by the Indians; this native-made cloth is used almost exclusively among the natives outside of the cities.

A Wallapai Indian Girl of Arizona with a Basket of Native Manufacture

Into the pattern of these baskets the Indians weave their myths and family history, prayers, etc.



Crop of Onions on Reclaimed Salt Marsh, Revere, Massachusetts

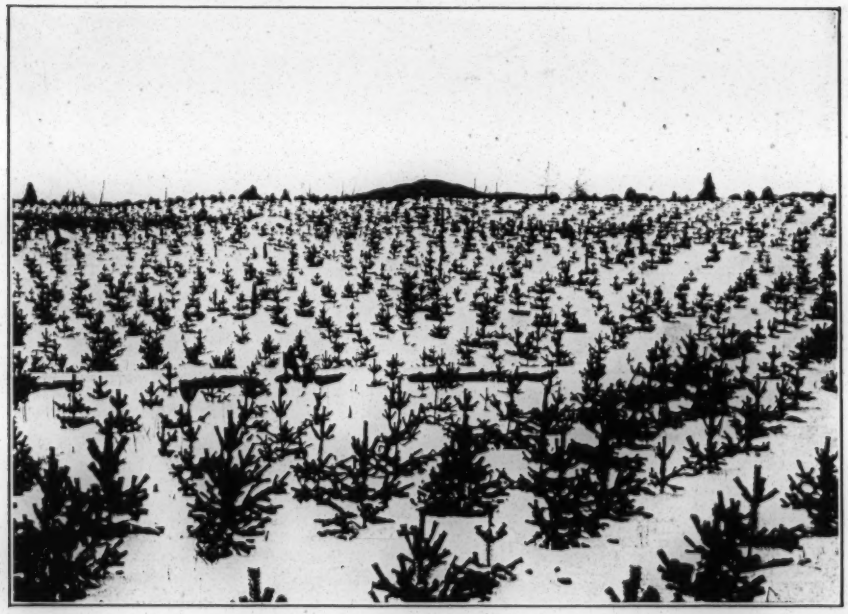
Photos from U. S. Dep't of Agriculture

Crop of Hay on Diked Meadow, Marshfield, Massachusetts

The tidal marsh lands along the Atlantic coast are estimated to have an area of about 1,000,000 acres. As part of these lands are near large cities, and would have a very high value for market gardening and the raising of fruit if they could be protected from the invasion of salt water and relieved of the water draining onto them from higher lands, the Department of Agriculture is helping to find a practicable method for making them useful.

XUM

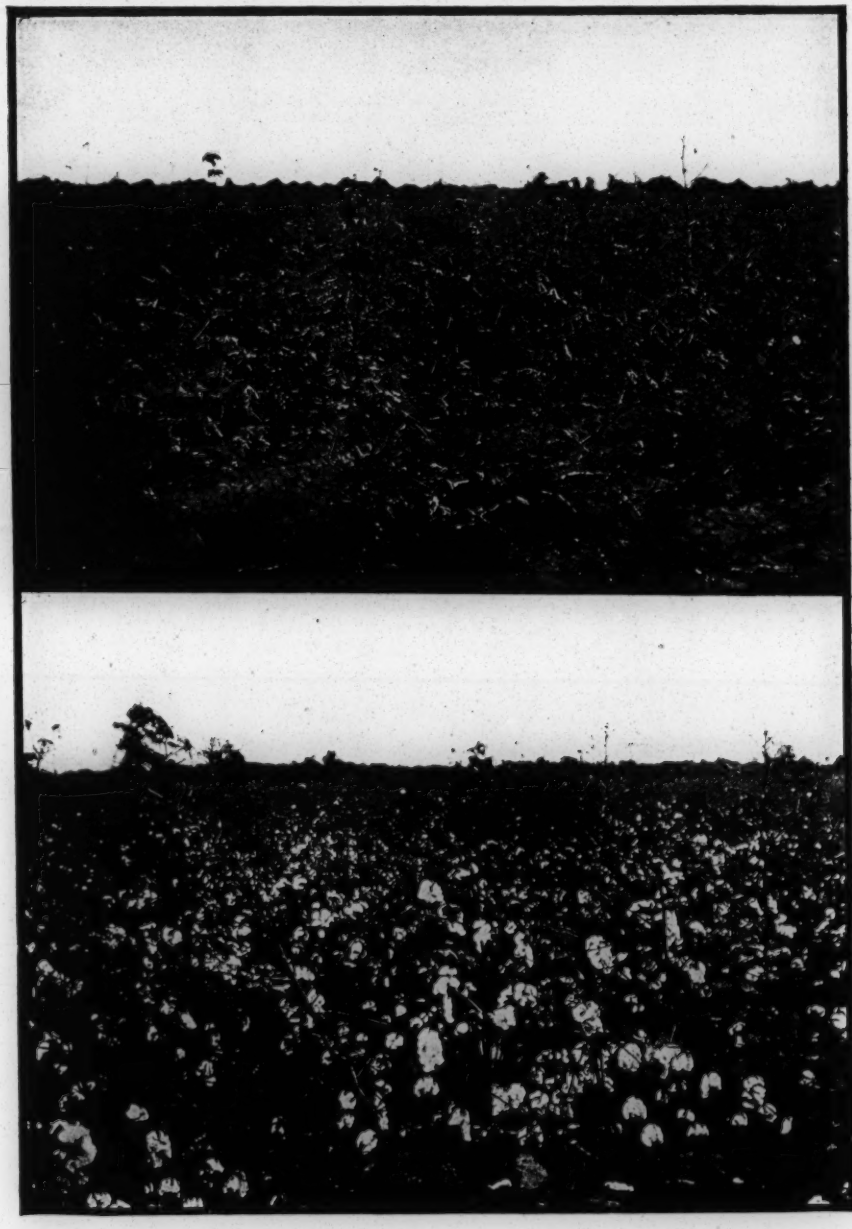
Scotch and white pine, 5 years old, in the Lake Clear plantation



Photos from U. S. Dep't of Agriculture

Successful Examples of Planting Denuded State Land

Transplant beds of nursery at Saranac Inn, New York. Norway spruce, 3 years old, in the foreground; Scotch pine to the left



Photos from U. S. Dep't of Agriculture

Early Versus Late Planting of Cotton in the Control of the Boll Weevil

The upper illustration shows a cotton field planted late and yielding nothing. The lower illustration shows a field on the opposite side of the turnrow on same plantation, planted and treated in accordance with directions of the Bureau of Entomolgy, and yielding three-quarters of a bale per acre.

THE MODERN ALCHEMIST

By Hon. James Wilson, Secretary of Agriculture

The following article has been abstracted by the Editor from Mr. Wilson's report as Secretary of Agriculture for 1907. No finer instance of the unselfish ingenuity and practical inventiveness of the American race can be found than what Secretary Wilson and the hundreds of trained specialists of the Department of Agriculture and of the Experiment Stations are doing to make gold from our soil for the American people.

THE year 1907 has been a year of untoward conditions, requiring all the industry and skill of the farmers to grow an average crop. They have struggled not only with an erratic season, but with a scarcity of help in all the states and territories of the Union.

Such a year, with its hard winter—summer weather in March and late cold spring—gives exceptional emphasis to the wisdom of this department's policy of diversifying farm products and of establishing new crops. A general crop failure in a field as large as the chief part of the temperate zone of a continent must be a rare occurrence.

No general crop failure afflicts the farmer this year, not even within small areas. The production of the farms, all things considered, is well up to the average of the previous five years in quantity, while its value to the farmer, as now appears at this annual day of reckoning, reaches a figure much above that of 1906, which by far exceeded any previous year's wealth production on farms.

Out of the farming operations of 1907 the railroads will get an average haul of freight, and foreign countries will take a heavy excess above home consumption. The farmer will have more to spend and more to invest than he ever before had out of his year's work.

THE DESERT FEEDS THE CITIES

When the Department of Agriculture brought durum wheat to this country from Russia and Africa during 1899 to 1902, the seed was sown that formed practically the entire foundation of the present crop of durum wheat. At a cost of $10,000 in the beginning, a crop worth $30,000,000 now grows in regions of low rainfall, where in the day of stock ranges the steer roamed on 20 acres to find his cud. This crop has encroached on the home of the prairie dog and of the cactus. It has spread throughout a wide strip of country, extending from northern North Dakota to southeastern New Mexico and northwestern Texas. It is a common crop in Montana and Idaho and in parts of Washington, Oregon, and Utah.

Durum wheat has entered into home industries. To a considerable extent it is mixed with other wheat in making flour for bread. It is promoting the manufacture of macaroni and kindred paste products in this country and is prepared as a breakfast food. It is the grain through which the desert feeds the cities of the east at home and abroad.

As an export crop durum wheat has become prominent. In 1905 Europe took nearly 10,000,000 of the 20,000,000 bushels produced; in 1906 about 20,000,000 bushels of the crop of that year.

Last year two-thirds of the exports went to Mediterranean countries. The former sheep and cattle ranges sent macaroni material to Marseilles, Naples, and Venice; to Greece, Spain, and the countries of western Europe; and even to the old homes of durum wheat—northern Africa and Russia. Shipments of this wheat were made to 43 ports in Europe and Africa named in trade reports of the collectors of customs, and to other ports unnamed.

With an average production of about

15 bushels per acre, durum wheat this year covered an area of over 3,000,000 acres, many of them valueless for agricultural purposes before the advent of this new crop. Its value to the farmer is over twice the entire cost of the Department of Agriculture during the current fiscal year, including the Weather Bureau, the costly meat inspection, and the Forest Service.

RAPID DEVELOPMENT OF BEET SUGAR

The beet-sugar industry has grown rapidly under aid and encouragement from the Department of Agriculture and the experiment stations and with favorable legislation by Congress and several state legislatures.

About 560 short tons of beet sugar were made yearly from 1879 to 1887; in 1891 the quantity was 6,000 short tons; in 1906, 483,000 short tons, and in 1907, 500,000 short tons.

As an acquisition to agriculture, much may be said in favor of growing sugar beets for the factory. Tillage must be of the best and the soil fertile. The pulp of the beets, after the extraction of the sugar, is relished by live stock. The crop is grown under factory-contract conditions, and the farmer knows upon what he may depend for profit.

Sugar factories occupy a belt across the continent in the sugar-beet zone and a belt from Washington to Arizona along the Pacific coast.

In 16 states there were 64 factories in 1906, with a capacity of working 49,500 tons of beets daily. In the western states, the growing of sugar beets has proved to be so remunerative that sugar-beet farms increased in value $42.49 per acre from 1900 to 1905, as determined by special investigation by the Department of Agriculture, or from $99.47 per acre in 1900 to $141.96 in 1905.

To the fostering of this industry by nation and states, it has responded by increasing the value of its production 543 per cent in nine years. The factory value of the refined sugar made in 1899 was $7,000,000, and in 1907, $45,000,000.*

One-third of the value of the beet sugar made this year would be enough to pay the cost of the Department of Agriculture during the current fiscal year and the national expense of the sixty experiment stations of contiguous United States when they shall have received the ultimate appropriation of the Adams act.

LUXURIANT ALFALFA

Alfalfa, that extraordinary plant for producing wealth and doing wonders to farms, is occupying an important place in the plans of the Department of Agriculture, the experiment stations, and the agricultural colleges. Through their efforts largely it has rapidly gained success in cultivation throughout a vast area. The value of the crop as hay this year is supposed to be $100,000,000, and if the plans and efforts now under way to promote its extension receive a reasonable reward, the value of the future crop will be several times the present amount.

This forage plant is a chemical laboratory in which nitrogen is taken from the air. It is a soil improver of the highest merit. As a flesh-forming feed for growing live stock, and as a milk and egg producer, it is unexcelled by any plant of large production.

It grows 2½ tons of hay to the acre as an average for the whole country where it is grown, or twice the average for all kinds of hay, and, besides this, is more nutritious than other hays.

The cultivation of alfalfa has been pressing eastward until now it has established itself as far as the longitude of eastern Kansas, except in southern Texas. It is established in some areas still farther to the eastward—in spots in Arkansas, in southern Wisconsin, northern Illinois, and northern Indiana, in the limestone regions of Kentucky and Tennessee, and in the southeastern corner of Michigan.

*The raw cane-sugar mill production of 1907 is estimated at 389,000 short tons, with a factory value of $28,000,000, the year 1904 alone exceeding this amount.

XUM

This plant is semi-established in Minnesota, Iowa, Missouri, Ohio, and is making its way in Illinois and Indiana. Elsewhere the growing of this plant is mostly experimental, but with promise of success.

Further extension of alfalfa-growing on large areas is a prize that will be worth hundreds of millions of dollars yearly; and it will be won. What has already been secured aided in the rescue of the farm production of this year from the disasters of the weather.

VALUE OF THE DEPARTMENT'S WORK IN DOLLARS

The foregoing striking features of the results of crop introduction and extension within the last few years are some of the illustrations of the wisdom of the great movement of the Department of Agriculture, of the experiment stations, and of the agricultural colleges, to fortify and buttress the agriculture of the nation against misfortune, and to give to it a sort of insurance by multiplying the sources of success. This policy has done much to keep the production of 1907 not only from disaster, but, all things considered, actually to keep it up to an average of recent years.

It is difficult to express in dollars the value of the work of the Department of Agriculture to farmers, and therefore to the nation, but an attempt to do so was made last winter for the Committee of the House of Representatives on Expenditures in the Department of Agriculture, which made a total of $232,000,000.

Fundamentally the work of the department is concerned with the production of wealth, as by increasing a crop yield per acre by plant breeding; or the preservation of wealth, as by suppressing insect and fungous pests; or by enabling farmers to make a fair sale of their products, as by promoting coöperative selling or by giving to the public information of the size of a crop in order that demand may be fairly adjusted to supply.

FABULOUS WEALTH OF CORN

Four-fifths of the world's production of corn, as nearly as can be determined, grows in the United States, and in the world's international trade in corn this country contributes one-third to one-half of the exports, not including the products of corn-fed animals.

Corn is the chief of crops and exceeds every other prominent agricultural factor of national prosperity. It is a human food and more especially a live-stock feed, with striking results. It is one of the great motive powers in the food of an energetic age. The starch of corn becomes the fat of the hog and the "finish" of the steer. No meat products are so much in demand in international trade as animal fats and oils.

Fear of a failure or a large degree of failure of the corn crop this year diminished after midsummer and at last the harvest secured 2,553,732,000 bushels—a production that is almost exactly the average of the crops of the preceding five years. There have been three larger corn crops—those of 1899, 1905, and 1906.

In value the corn crop of this year is much above the high-water mark of 1906, On the assumption that the crop will be sold by farmers at an average price not below the present one, its value is estimated to be $1,350,000,000, or 26 per cent above the average value of the previous five crops. Four crops before had exceeded one billion dollars in value.

The farm value of the corn crop of eight such years as 1907 would pay for duplicating every mile of steam railroads in the United States and pay for their costly terminals, rolling stock, and all property. In thirteen years it would replace the present banking power of this country in banking capital, surplus, deposits, and circulation, and in seventeen years it would replace the banking power of the world.

OUR COTTON UNRIVALLED

The farm value of the 1907 crop of cotton and its seed is estimated to be from

$650,000,000 to $675,000,000. Its farm value is probably a little below that of last year's crop. Otherwise it will be the most valuable cotton crop ever raised in this country and 7 per cent above the average farm value of the crops of the previous five years.

The year was a trying one to cotton from planting time to nearly the end of the summer, but even under adverse conditions a crop has been produced that will be sufficient, with the surplus of last year, to meet the requirements of spinners until the next harvest.

The fears of a cotton famine that followed the low production of this country in 1901 have not been justified, and in the meantime efforts to make European spinners partly independent of the upland cotton of the South by aiding the growing of "colonial" cotton have not made themselves felt.

Among the strong points of advantage possessed by this country's cotton is the low cost of transportation to market. Recent investigations by this department indicate that the average cost of transporting cotton per 100 pounds from farm to local shipping point is about 16 cents; from local shipping point to seaport, about 40 cents, and from seaport to the United Kingdom, about 32 cents, the total being only 88 cents per 100 pounds, or less than a cent a pound.

TOTAL WEALTH PRODUCTION IN 1907

Wealth production on farms in 1907, as expressed in value, transcended the high record of 1906, which was itself much above the highest amount before reached. In arriving at the total the farm products of the year are estimated in value for every detail presented by the census and at that point in production at which they acquire commercial value.

The grand total for 1907 is $7,412,000,000. This is $657,000,000 above the value of 1906, $1,103,000,000 above that of 1905, $1,253,000,000 above that of 1904, $1,495,000,000 above that of 1903, and $2,695,000,000 above the census amount for 1899.

The value of the farm products of 1907 was 10 per cent greater than that of 1906, 17 per cent over 1905, 20 per cent over 1904, 25 per cent over 1903, and 57 per cent over 1899.

During the last nine years wealth, estimated as above explained, was created on farms to the fabulous amount of $53,000,000,000.

Besides the crops, there were farm dairy products in 1907 which nearly reached $800,000,000. The price of butter increased 4¾ cents a pound over 1906 and of milk three-fourths of a cent a gallon.

More than $600,000,000 must be regarded as the value of the poultry and eggs produced on farms in 1907. The amount may easily have been larger. This industry has advanced at such a rapid rate that no arithmetic can keep up with it. The farm price of eggs in 1899 was 11.15 cents per dozen as an average for the United States; in 1903, 12.37 cents; in 1904, 17.2 cents; in 1905, 18.7 cents; in 1906, 17 cents, and in 1907, 18.2 cents.

Dressed poultry in New York sold for 10.78 cents per pound wholesale in 1899, for 12.97 cents in 1903, for 12.57 cents in 1904, for 13.36 cents in 1905, for 13.2 cents in 1906, and for 14.9 cents in 1907.

MOST OF OUR FOREIGN CREDIT PROVIDED BY FARMERS

The farmer provides the great bulk of the foreign credit which other classes of persons draw upon in the contrary movement of credit against this country.

The balance of trade in farm products in favor of this country in 1907 was $444,000,000, an amount that has been exceeded in only four years—1898, 1899, 1901, and 1902. In all other products the trade of 1907 produced a balance of only $2,500,000 in favor of this country.

In eighteen years beginning with 1890

the farmers have not failed to secure a balance of at least $193,000,000, the low amount of 1895. The great aggregate of the 18 balances in the trade in farm products is $6,500,000,000, while the trade in other commodities during the eighteen years resulted in a grand adverse balance of $456,000,000.

So a great stream of wealth has constantly been sent from farms to foreign countries to offset the adverse balance of trade in commodities other than agricultural; to pay the ocean freight costs on imports conveyed in foreign-owned ships, and to pay the interest, dividends, and principal on investments in the United States by foreigners. It is the farmer who has sent credit to expatriated Americans; it is he who has provided the immigrant with millions to send every year to the loved ones in the old countries; and, if there is still any credit to dispose of, the farmer has provided the American traveler in foreign countries with his pocket money.

WORLD'S RECORD FOR HIGH FLIGHTS OF KITES

The creation of a research observatory at Mount Weather, Virginia, and the gathering together of a highly trained staff of men for the study of meteorological problems marks an important epoch in the development of meteorological science in this country. One of the first results achieved by that staff was the sending of meteorological instruments, by means of aëroplanes, to a greater altitude than has hitherto been accomplished. On October 3, 1907, the world's record for high flights was exceeded. On that day eight kites, in tandem, carried the meteorograph to an altitude of 23,111 feet above sea-level. Daily observations of upper-air conditions have been continued for over three months in succession, practically without interruption, and it is probable that this record will be maintained indefinitely in the future. The observations obtained in this manner are placed before the forecast official in Washington each night. The latter is thus informed of the vertical gradients of temperature and the direction of the wind for altitudes varying on the average from one-half mile to two miles. These facts are of great importance in the making of forecasts for the Middle Atlantic and New England States and for the elucidation of many problems of the upper air that hitherto it has been impossible to study.

In the past forecasts of the weather, as is well known, have been based entirely upon the existing horizontal gradients of pressure and temperature at the surface of the earth. The formation of charts showing the distribution of temperature with increase of elevation above the earth's surface, which is now for the first time possible in our weather service, so graphically tells the story of the rise and fall of the thermal levels that the layman is able to comprehend their significance. It is apparent that when a comparatively deep stratum of abnormally warm or abnormally cold air persistently overlies a region the action of a moving cyclone or anticyclone on the weather experienced at the bottom of the atmosphere will be materially different from that which would be experienced were the upper air at a normal temperature.

The significance of these data from the view-point of the forecaster is not yet fully understood, but certainly they present a fund of information that will be studied with profit by those whose duty it is to add to our limited knowledge of the science that must precede the art of weather forecasting.

The upper-air work at Mount Weather is thus described in detail because it is the one line of inquiry that at present holds out the greatest promise of immediate utility. The results already secured are deemed to be of such value that it is hoped means will be provided for the diligent prosecution of other lines of research work.

BREEDING FOR NEW ANIMALS

The work in the breeding of American carriage horses, in coöperation with the

Colorado experiment station, is progressing satisfactorily. During the fiscal year 11 foals, the progeny of selected parents, were dropped—2 males and 9 females. No additional horses were purchased.

The work in breeding Morgan horses, which is being carried on in coöperation with the Vermont experiment station, has been greatly extended through the generosity of a public-spirited citizen of Vermont, who donated to the department a farm of 400 acres near Middlebury, to be used in these operations. There were in the Vermont stud on July 1, 1907, 1 stallion, 9 brood mares, 1 two-year-old filly, 8 younger fillies, and 1 weanling colt.

There is great need of a breed of sheep suitable to the range conditions of the West, the requirements being for sheep that will yield a profitable clip of wool, produce good mutton lambs, and stand flocking in large numbers. It is believed possible to combine these characteristics in one breed, and with this idea in mind an experiment was begun in the fall of 1906 in coöperation with the Wyoming experiment station. Eighty-nine ewes and four rams have been purchased for foundation stock.

Experiments in developing a milking strain of short-horn cattle have been begun in coöperation with the Minnesota experiment station and with nine Minnesota breeders, the latter having agreed to allow their herds to be used and to manage them according to instructions of the department and the station.

MILK OF WASHINGTON, D. C.

A feature of the year's work was the investigation of the milk supply of Washington, D. C. Nine hundred and sixteen dairies and dairy herds, with 16,446 cows, were inspected and rated in accordance with a score card prepared by the Dairy Division. With few exceptions, the conditions found were very unsatisfactory, the average score being only 45 out of a possible 100. This result may be considered as giving some indication of the quality and condition of the milk supply of the country, as it is believed that the conditions around Washington are no worse than those existing around other large cities.

The department is taking an important part in the general movement for a better milk supply, and assistance in that direction has been rendered to a number of cities.

PREVENTION OF "PEACH BLIGHT"

For a number of years it has been a problem with pathologists to find some successful way of treating the peach with fungicides in order not to injure the foliage. Some of the standard fungicides often cause complete defoliation. For this reason it has been found difficult to control a number of serious diseases affecting the peach by any of the ordinary treatments. This year it was discovered that a sulphur wash made by combining lime and sulphur, with no other heat than that produced by the slaking of the lime, gave a preparation which was not injurious to peach foliage and which prevented the scab and reduced peach rot to 10 per cent on the sprayed trees, whereas unsprayed trees had 75 per cent of the disease. This fungicide, further, completely prevented the leaf-spot fungi and produced no injury whatever, either to foliage or fruit. While this preparation has been previously used in winter, when the trees were dormant, this is the first time it has been tried on trees in active growth, with the success as indicated.

Last year mention was made in this report of a very serious disease of the peach in California, popularly known as "peach blight." Experiments were conducted during last fall and winter for the control of this disease, and, as the result of this work, it was found that the disease could be completely controlled by the use of standard Bordeaux mixture or lime and sulphur wash applied early in the fall, about the time of the first rains. The methods recommended by the department were widely used in California the past season with complete success, and we have been reliably informed that the treat-

XUM

ment has meant many millions of dollars to the peach industry of that State.

ORIENTAL PLANT EXPLORATIONS

China has proved a fruitful field for this work, and an explorer has been kept there constantly during the year. His work has taken him through the little-known regions of southern Siberia, the border of Manchuria, the excessively dry mountains west of Pekin, and through the fertile country between Pekin and Hankau. This explorer has sent to this country over a thousand living seed and plant specimens for trial. Among these are promising blackberries and currants from northern Korea; a north Manchurian apple; a collection of 24 named pears from north China; several bush cherries and plums and peaches from northern Siberia — perhaps the very northern limit of peach culture in the Orient; drought-resistant alfalfas; dry-land rices; staple foods of the native Manchurians, but unknown to us, from regions where the climate is similar to that of the Dakotas; and a cherry noted for remarkable earliness, ripening its fruit in mid-April in northern California. Besides these, the explorer has sent in a large number of ornamental plants which our nurserymen have been for some time anxious to secure, because of the unusual hardiness of these north China species.

NEW ALFALFAS AND CLOVERS

During the year an explorer has returned with seeds of the yellow-flowered Siberian alfalfa, and these seeds have grown into promising plants in the severe climate of the Northwest. The results of their trial will determine whether we shall import large quantities of the seed, as we have previously done with the Turkestan and Arabian alfalfas, both of which continue in their respective territories to gain in popularity. The Toten clover, also secured from Norway, where it is cultivated for its extreme hardiness, is being tested in the Dakotas.

For the rice growers of the South there have been introduced 46 varieties from different parts of the world, among them the one-hundred-day rices—early sorts, which, in Japan, give crops when ordinary rices fail.

The fruit-growers of our tropical possessions have had their interest in mango growing stimulated by the fruiting of some of our East Indian fine-flavored varieties. All the local nurseymen are ready to sell in quantity several of the introductions of the department, and not only are the experiment stations of Hawaii and Porto Rico taking up this fruit, but, what is especially important, private plantation owners are planting out orchards of our introduced sorts.

The growing scarcity of wood for manufacturing purposes has led the department to make some extensive investigations of bamboo culture in Japan and other countries. Already a number of varieties have been introduced and steps have just been taken for the inauguration of a considerable number of plantations of these important plants in different parts of the South.

During the spring and summer of 1907 a new date garden was established at Indio, California. A new date garden has also been established at Laredo, Texas, in a part of the Rio Grande Valley where the climate in spring and early summer is the hottest in the United States. It is believed that good dates can be grown in this part of Texas. The date palms in the Mecca garden, now from two to three years old, have begun to fruit freely, and the famous Deglet Noor and a number of other choice varities have ripened perfectly, in spite of the fact that the season has been unusually cool. During the past year much interest has been taken in the planting of seedling date orchards in the hope of securing new varieties better adapted to American climatic conditions. Altogether some 150,000 date seeds have been planted in coöperation with growers in California, Arizona, and Texas. These growers will receive one or two offshots from imported date palms for every 250 date seedlings set out in proper form.

DROUGHT-RESISTANT OLIVES

With the opening up of territory in the Southwest, demands are being made upon the department for information regarding the best crops for this extensive dry-land country. Southwestern Texas is a promising field, especially in the matter of arborescent crops. Investigations made in southern Tunis by the department have revealed the existence of extensive olive orchards in that region carried on where the annual rainfall is sometimes below 10 inches for several consecutive years and where the annual evaporation is over 100 inches. The olive grown under these extreme dry-land conditions has been imported and shows every promise of doing well in some parts of Texas and Arizona.

Studies made the past year in the Southwest have revealed the existence of a number of species closely allied to the almond and peach of the Old World. Several of these occur in very dry situations and one is distinctly of promise as a stock upon which to graft almonds, apricots, and other stone fruits for culture on unirrigated lands. Another species growing in central Texas bears a very early ripening fruit of fair size which is said to be of delicious flavor. Plants of this "wild peach" have been secured and selections will be made with the hope of obtaining a native drought-resistant peach-like fruit which can be grown in regions where peaches do not now succeed.

NEW WEALTH FOR THE SOUTH

One of the most important forage crops is the cowpea, which is to the South what clover is to the North. During the year extensive investigations have been made of this crop, the principal object being to secure cheaper and better seed so as to bring about a great increase in cowpea culture. Special machinery has now been developed for harvesting the upright-growing varieties. The need is for good varieties producing small, hard seeds that will not crack and that retain their vitality for more than one year. Many new varieties have been secured from foreign countries and a large number of others developed by hybridization, some of which show great promise.

The rice-growers of the South, especially in Louisiana and Texas, have long felt the need of a legume that might be grown in rotation on their rice lands. The department has been successful in introducing a specially adapted variety of soy bean used on the rice lands of central China. These soy beans have been tested and give every promise of filling the need perfectly. Three varieties have been secured, all very similar and characterized by great leafiness, fine stems, and large size, becoming 6 feet high, so that they produce large crops of excellent hay. Thus we have a combination of crops which will, we hope, do for the rice-growers what clover does for the wheat fields of the North, serving not only as a valuable soil improver but as an important forage crop as well.

Numerous attempts have been made to grow Egyptian cottons in this country. During the year gratifying progress has been made in this work, Egyptian cotton of the Mit Afifi variety having been grown quite successfully under irrigation at Yuma, Arizona. One selection has yielded at the rate of 500 pounds of lint per acre, which is unusually high for Egyptian cotton in this country. Some of the improved upland strains have also given equal and even superior yields in this region. The upland varieties that seem at present most promising for this important agricultural section of the Southwest are the Southern Hope, Sunflower, and Columbia, the latter being a variety improved by the department in South Carolina.

As a result of the Department's experiments the camphor industry has been established on a firm basis. A large acreage is being planted to camphor in Florida, and interest in the growing of

this crop is increasing. From 3,000 to 4,000 acres of the trees are being prepared for planting in Florida alone.

BREEDING VARIETIES THAT CAN RESIST DISEASE

The question of securing rust-resistant varieties of asparagus has been given special attention during the year. The rust disease of asparagus is threatening this industry in a number of sections and the efforts being made are for the purpose of securing types which will be resistant or immune to the disease.

Work in the breeding of wilt-resistant melons was practically completed during the year. The new wilt-resistant hybrid melon was grown on a commercial scale during the past season and easily held its own in the market with the varieties of its class. It produced an excellent crop on land where ordinary melons were destroyed by wilt. In connection with the breeding of wilt-resistant cotton, further tests have been carried on with upland cottons. Some of these upland wilt-resistant types have not only proved valuable from the character of their lint, but also from the quantity of fiber produced. Considerable work has also been carried on in the matter of breeding alkali-resistant and drought-resistant plants. This work has included such crops as cereals, forage crops, grasses, and sugar beets.

NITROGEN BACTERIA AND SEED ADULTERATION

The distribution of bacteria for inoculating various legumes has been continued during the past year with increasing success. It has been found especially important to carefully examine soil conditions before inoculation, and a method of doing this quickly in the laboratory has been devised. Over 18,000 cultures have been distributed during the year, and, from the reports received to date, they have been used with success in the majority of cases.

The work against seed adulteration has been continued with gratifying results. Aside from the continued sale of Canada bluegrass seed for Kentucky bluegrass seed, fewer cases of adulteration have been found than in former years. The importation of low-grade red-clover seed has continued, some lots containing over 8,000,000 weed seeds per bushel.

THE TRUSTEE OF OUR FORESTS

At the beginning of the fiscal year the area of the national forests was less than 107,000,000 acres; at its close, more than 150,000,000 acres. Nearly all the timber land of the unappropriated public domain is now under actual administration by the Forest Service. This means that it is being protected against fire, theft, and wasteful exploitation, that its power to grow wood and store water is being safeguarded for all time, and that nevertheless its present supply of useful material is open to immediate use wherever it is wanted.

The government is not a landlord owner, but a trustee. Hence timber is given away through free-use permits only in small quantities to the actual home maker, who comes to develop the country, and in larger quantities to communities for public purposes. Otherwise it is sold to the highest bidder, but under such restrictions as look to the maintenance of a lasting supply answering to the needs of the locality, to be had without favoritism and without extortionate demand based upon the necessity of the consumer.

The forests are already self-supporting, though they have been under the control of expert foresters less than three years. The total expenditures of the Forest Service for all purposes during the year was $1,825,319.50—considerably less than I estimate that the receipts from the forests will be during the present year. As yet, however, from the standpoint of true economy the expenditure for the protection and improvement of these forests is far too low.

France spends annually upon state forests less than one-fiftieth the area of our own over $2,500,000 and realizes $4,230,000; Prussia spends upon 7,000,000 acres

over $11,000,000 and realizes $17,054,-144; Saxony spends upon only 400,000 acres over $900,000 and realizes $1,651,-882. Yet in all these countries, unlike our own, the forests have had great sums spent upon them in the past in the form of permanent improvements, to which are largely due their present returns. A forest can no more be made to yield a constant return in valuable products without the investment of capital in improving the property than can a farm.

IMMENSE POSSIBLE PROFITS FOR THE PEOPLE

If the United States spent as much per acre upon these forests as Prussia does upon hers, they would cost each year $250,000,000. If they brought in as much per acre, the gross revenue which they would yield would amount to $650,-000,000, and the net revenue to $400,000,-000. The development of the wealth-producing possibilities of the national forests—not, it must be insisted, in the narrow sense of income yield to the national treasury, but in that of economic usefulness to the people—is hardly begun.

I have asked for an appropriation for the Forest Service during the fiscal year 1909 of $3,200,000. This, if all spent upon the national forests, would amount to 2 cents per acre. France spends annually upon her state forest 95 cents per acre, Switzerland $1.32, Prussia $1.58, and Saxony $2.32. These are the countries in which the management of the forests is most profitable in products. The countries which spend most do so because their forests are brought to a high state of development. Thus utilizing their full productive powers, they derive from them a net profit which is very high. On the other hand, the countries like Sweden, Hungary, and India, which spend from 2 to 34 cents per acre, derive a very low revenue—in other words, a small volume of products—from their forests.

It is as sure that forest land can be made to grow successive crops of trees under proper methods as that plow land can be made to grow successive crops of wheat; as sure that forests can be made to conserve the water supply as it is that manuring enriches the soil.

The use of the national forests by the people of the West is increasing at an extraordinary rate. The value of timber sales, the number of stock grazed, the demand for free-use and special-use permits all tell the same story. The forests are more and more contributing to the material welfare of those in their vicinity.

IMPROVING THE RANGE

Unlike the demand for timber, the demand for range in the national forests is already large enough to employ practically the full productive capacity of the land. There were grazed last year, on the forests over 1,200,000 horses and cattle and 6,650,000 sheep and goats, representing a total investment of perhaps $44,000,000 and a probable annual profit, under the conditions of recent years, of $8,000,000. Upon the cattle industry of the western range depends to a large extent the farmer of the prairie states for the profitable marketing of his corn crop, the workingman of the East for his food supply, and our foreign trade for one of its important articles of export. Under the conditions which obtained before the Forest Service undertook to regulate grazing, the carrying power of the range had seriously fallen off through overgrazing and competition. By putting a stop to these evils the Forest Service has not only partially restored the range to its former carrying power, but has also given greater stability to the stockman's industry by recognizing his right to protection against newcomers, and made it possible for him to bring his stock through in better weight and condition.

An exhaustive study of the possibility of range improvement through artificial seeding, through changes in the present methods of handling stock to favor the growth of the best native forage plants, and through extermination of poisonous plants has been inaugurated. The whole problem of range control and improve-

ment will be pursued until every part of the range in national forests is producing the best crops of forage which the circumstances will allow.

SOWING NEW FORESTS

The fires of past years and centuries have stripped great areas of western mountain timber land of all forest growth. The need of conserving the rainfall and snowfall of these areas makes reforesting a step of urgent necessity. At the same time it is often one of the utmost difficulty. In dry climates particularly (where the need is greatest), to establish a forest without prohibitive expense calls for the most careful study.

After plantations are apparently well established a season of unusual drought may turn the scale against the growing trees. Millions of acres must be planted—and this means that thousands of millions of small trees must be raised—but there is yet much to be done before planting on a scale commensurate with the needs can be begun. This preliminary work is being pushed with as much energy as the funds available for the work will permit.

In a large part of the Northwest, at least, there is good reason to believe that broadcast sowing of seed may be practicable. If this proves to be the case, the way will be open for restoring to forest cheaply very much of the burned-over land. Hitherto the experimental sowings have shown surprisingly good results. The country's need of timber is certain to be so acute before many years that the work can not be entered upon too quickly.

That the United States is even now nearing a time of severe scarcity of lumber is no longer a matter of doubt. Each year makes a further heavy inroad upon the remnant of our virgin forests, and the growth of our abused and depleted forest lands for three years would not meet our needs for one.

MAKING COMMON WOODS MORE DURABLE THAN OAK OR CHESTNUT

An easy and inexpensive method of treating fence posts has been perfected which makes it possible for any farmer to make the quickly decaying woods, still abundant because hitherto thought almost worthless, far more durable than untreated white oak or chestnut. Demonstrations of this method before southern farmers were received with enthusiasm. For the middle West, where the common woods are seldom resistant to decay, the matter is certainly no less important. Essentially the same method is being applied to the butts of telegraph poles and to mine props. The enormous consumption of timber for the latter purpose and the extreme rapidity with which it decays in the dampness and darkness of the mine open the prospect of a large economy from the use of this method of treatment, which has stood a searching practical test in Pennsylvania coal mines. By applying the same treatment to timbers from the national forests a use will be found for dead wood and a decided benefit will be conferred on the users of the timber. The work includes a study of the comparative merits of different kinds of preserving fluids.

The investigations aimed at discovering new sources of paper pulp have demonstrated that a number of woods of abundant supply, never in the past thought of for the manufacture of paper, are capable of yielding pulp of standard grade. Studies in wood distillation are establishing the practicability of obtaining turpentine from waste southern pine material.

Ten thousand separate tests of the strength of timber, largely in the form of full-sized structural beams, have established the relative value of a number of woods and proved the fitness for hitherto unthought of uses of several of them.

THE FOOD PRODUCED BY OUR FARMERS CAN BE INCREASED MANY TIMES

There are in the continental United States 1,900,947,200 acres of land. Of this, the tenth census showed 838,591,774 acres in farms, with 414,498,487 acres in improved lands and 289,734,591 acres actually in crops.

With a more thorough knowledge of the soil and its adaptation to crops and the proper methods of soil management, the full extent of the agricultural development which may take place in the United States in the future is very great. The undeveloped portions of the United States are not confined wholly to the arid West. When we realize that we have 77,000,000 acres of swamp land in the eastern half of the United States—an area equal to all of the New England States, New York, and half of Pennsylvania, or to the combined areas of Illinois and Iowa—which can be reclaimed, and which, under the prevailing climatic conditions when so reclaimed, are exceedingly productive, and when we realize that only 16 per cent of the State of Louisiana, for example, and a smaller percentage of the State of Texas is in improved lands, the possibilities of development become more apparent.

The soil survey work of the department is the largest undertaking of the kind that has ever been inaugurated in any country. The area surveyed and mapped during the past fiscal year was 20,560 square miles, or 13,158,400 acres, and there have been completed to June 30, 1907, surveys covering a total of 139,247 square miles, or 89,118,080 acres. This area is more than 15 per cent of the amount represented by the farm lands of the United States. The work has been so distributed as to include every large representative district in the United States.

One of the most important problems being studied by the department is the intelligent use of commercial fertilizers. In some sections of our country, especially in the South and East, the quantities now used are enormous, and this use is gradually extending. That the amount of money annually invested in fertilizers by the farmers of the country, now amounting to upward of $100,000,000, will continue to increase seems certain. But just as certainly a large percentage of the money—perhaps a third—is annually wasted and brings no adequate return, owing to a lack of understanding of the soil's requirements.

According to the latest determinations the rivers of the United States are annually pouring into the seas fully 1,000,000,000 tons of sediment. The volume of material thus lost to the land is increasing with settlement and cultivation; it is almost wholly washed from the surface and is the very richest soil material, the cream of the soil. The value of the material is not easily fixed, but at a moderate appraisal the annual loss would exceed all the land taxes of the country.

Part of this wastage may be avoided by deeper cultivation, drainage, terracing, etc., to which effective and simple methods the public is being educated by the department.

THE BOLL WEEVIL CHECKED

That the cotton-growers can be protected from the boll weevil by planting cotton early and by burning the plants in the fall, after the cotton has been harvested, has been proved by many experiments of the entomologists of the department. In one isolated locality in Calhoun and Jackson counties, Texas, badly infested with the weevil, 410 acres, comprising all of the cotton in that vicinity and separated from other cotton plantings by about 10 miles, were cut during the first ten days of October, 1906. In Lavaca county, 30 miles away, a considerable quantity of cotton was not destroyed, and the fields were kept under observation as a check. The results were as follows:

In May, 1907, in the experimental fields only one weevil was found, whereas in the check fields the weevils were so numerous that practically all of the squares had been destroyed. In September, 1907, the cotton in the experimental fields showed a yield of about 1,000 pounds of seed cotton per acre, while in the check fields the average was about 350 pounds of seed cotton per acre, and this in spite of the fact that the soil on the check area

is much richer than that in the experimental area. The destruction of the plants in October has caused the poorer land to produce practically three times as much cotton as the richer land. The proper treatment of the fields in the experimental area resulted in an advantage to the farmers of $20 per acre.

By burning the cotton plants after the harvest many millions of weevils in one stage or another are killed which otherwise would successfully pass the winter and infest the next year's crop.

IMPORTING BENEFICIAL INSECTS FROM EUROPE

The introduction of the parasites and predatory insect enemies of the gipsy moth and the brown-tail moth has been continued with great success, and it is reasonably certain that the gipsy moth can be held in check by these imported natural enemies just as it is in Europe.

In the early summer of 1907 the Chief of the Bureau of Entomology again visited parts of Europe, and by coöperation with European entomologists succeeded in introducing a much larger number than ever before of European parasites of the eggs and of the lavæ and pupæ of both the gipsy moth and the brown-tail moth. Two new species of primary parasites were introduced from Russia, and one of these proves to be a very rapid breeder and promises the best results.

These insects have been cared for in large indoor and outdoor breeding cages in the vicinity of Boston, and many thousands of specimens have been liberated in the open. There is abundant proof that several species have established themselves, and there is every reason to suppose that they will breed with greater or less rapidity. It is hoped that the results of the work of these parasites will be evident by the summer of 1909, and there is a possibility that they may be evident in 1908.

The life histories and habits of these parasites are being studied by expert assistants in the laboratory near Boston, and careful observations at the same time are being made by agents of the department in France and in Russia. Six generations of one species have been followed through during the past summer.

Altogether 35 species of these beneficial insects have been imported. Of these, 14 are hymenopterous parasites, 16 are dipterous parasites, and 5 are predatory beetles.

SENDING USEFUL INSECTS ABROAD

European officials have been so generous in their assistance to this country in these importations of beneficial insects that the department has endeavored to return the courtesy wherever possible. Continued sending of scale-insect parasites have been made during the year to Italy with promise of success.

An interesting coöperative experiment was begun during the year with the French government, and successful sendings of a predatory wasp from the Southern States to Algeria were made. On arrival in Algeria these wasps were cared for by agents of the Pasteur Institute of Paris, acting for the French colonial government, in the effort to establish a species which will destroy the gadfly, which carries a very destructive disease of the dromedary, so important in that country as a beast of burden.

HESSIAN FLY INVESTIGATIONS

The wheat-sowing experiments have been increased during the year, and are now being carried on in eleven states, over 800 different sowings having been under constant observation this year. Exact data are being continually accumulated, showing that it is possible to evade the most serious portion of the fall attack of the Hessian fly by seasonably late sowing in the fall.

An important branch of the Hessian-fly work has demonstrated the possibility of the practical use of the parasites of the fly. A striking example has developed during the year. Early sown plats at Lansing, Michigan, and Marion, Pennsylvania, were seriously attacked by the fly, but when examined at a later date

fully 90 per cent of the flaxseeds were found to have been stung by a certain species of parasite and to contain its developing larvæ. At this time a field of wheat near Sharpsburg, Maryland, was found to be infested by the fly and examination indicated the absence of parasites. On April 8 some thousands of the parasitized flaxseeds from Pennsylvania were brought to Maryland and placed in the field. On July 8 an examination of the Maryland field showed that the parasites had developed so rapidly as to bring about an almost total destruction of the fly.

ENCOURAGING SILK CULTURE IN THE UNITED STATES

Eighty-five ounces of tested silkworm eggs were imported from Italy and distributed to 343 applicants in the spring. About 11,000 seedlings of the best white mulberry were also distributed. Cocoons were purchased from American growers at a rate varying from 90 cents to $1.15 per dry pound, and these cocoons were reeled at the department. The reeled silk on hand was sold during the year at $4 a pound, bringing in a return of $1,012.

TRAFFIC IN CAGE BIRDS

The Biological Survey has continued the work of educating the public, and especially the school children, regarding the economic value of birds as insect destroyers, and the duty of protecting them.

The fact that 400,000 cage birds, most of them canaries, are yearly imported into this country, and that the number is constantly increasing, will surprise many. There seems to be no reason why most if not all the cage birds required in this country should not be raised here. The industry is very profitable in Germany and elsewhere abroad, where it is carried on by the women and children of individual families, who, with comparatively little labor and trouble, add an interesting occupation to their ordinary household duties and secure satisfactory returns in cash. The mountain regions of the Southern States, particularly, would seem to furnish almost ideal conditions for such an industry, which, besides being lucrative, possesses the added advantage of substituting domestic birds for such wild species as the mocking bird, cardinal, and nonpareil, whose value to agriculture is too great to make it desirable to confine them in cages.

DUCKS AND SHORE BIRDS

In the past, one of the important food sources of the United States was its game, particularly its ducks, geese, and shore birds, thousands of which found their way to the markets of all our large cities, to be used for food by rich and poor. Unfortunately the natural supply of these birds was not wisely husbanded with an eye to the future, but, as in the case of the buffalo and wild pigeon, they were mercilessly pursued, till at the present time not a few species are threatened with speedy extinction. The subject is important, and it is obvious that if the more desirable species of ducks and geese are to be preserved for the future, additional legislation is needed. The essential data to serve as a basis for legislative action are a knowledge of the food supply and of the pairing times of the several species of ducks, geese, and waders, and of the routes they pursue in migration. These subjects are now being carefully investigated.

Our game birds are constantly diminishing in abundance, and the practice of introducing foreign birds as a substitute grows in favor. Many species, serving both for food and sport, have already been more or less firmly established in various parts of the country. During the year Illinois imported more than 1,000 European partridges, and Kansas imported about 2,000 English pheasants. Capercailzie and black game of northern Europe, the former of which is nearly as large as wild turkey, have been imported successfully for liberation at various points, notably on Grand Island, Michigan, and in the Algonquin Park, Ontario.

The experiment of stocking covers by means of imported eggs of game birds also is apparently meeting with favor. Under the act of June 7, 1902, every such consignment requires a permit from the department. More than 5,900 eggs were imported during the year.

Life-zone maps of the several states are now in course of preparation, to be followed by lists of crops and fruits best adapted for cultivation in the different areas. The essential purpose of this work is to furnish the practical farmer a guide to the crops best fitted for any given area. The great demand for the generalized map and report already published and for the more detailed maps not yet finished is an earnest of the practical importance of this work.

THE BIGGEST PUBLISHING HOUSE IN THE WORLD

The results of the investigations conducted by the department are made known and become available for the use of the people by means of publications, of which 1,415 were issued during the year, 596 being new and 819 reprints. These publications comprised 52,363 printed pages and the total number of copies aggregated 16,746,910, being an increase of 3,258,889 copies over last year.

The farmers' bulletins continue to be the most popular publications of the department. Forty-two new bulletins were issued during the year, the number of copies printed being 1,100,000, while 443 reprints of bulletins were made in editions aggregating 5,369,000, the total number of Farmers' Bulletins printed in the year being 6,439,000 copies, of which 3,484,713 were distributed upon the order of Senators, Representatives, and Delegates in Congress. The total number of Farmers' Bulletins printed and distributed since the series was created in 1889 is 55,125,000, of which 37,400,161 have been distributed by members of Congress.

HELPING THE FILIPINO FISHERIES

ON October 14, the steamer *Albatross*, of the United States Bureau of Fisheries, sailed from San Francisco for the Philippine Islands, via Honolulu and Guam. By direction of the President, and at the solicitation of the insular government, the vessel has been detailed for a comprehensive investigation of the fisheries and an exploration of the waters of the archipelago.

Lieut. Commander Marbury Johnston, U. S. N., is in command, and the fishery and scientific inquiries will be under the personal direction of Dr Hugh M. Smith, Deputy Commissioner of Fisheries, who will be aided by a small corps of assistants from the Bureau. The National Museum has a representative on board in the person of Dr Paul Bartsch.

The chief objects of the expedition are a thorough study of the present condition of the fishing industry, a determination of the aquatic resources of the islands, and a demonstration to the natives of the best means of catching and utilizing the available resources. Other matters that will receive attention are fishery legislation, the cultivation of fresh-water and marine animals, and the foreign fishery trade. A great amount of dredging and sounding will be done in order to ascertain the location of the fishing grounds and the distribution and abundance of the bottom species; and it is expected that this work, taken in conjunction with the collections made in surface and intermediate waters, will have much scientific interest, aside from its practical bearing.

The *Albatross* has recently been put in a high state of efficiency, and is now equipped with the most modern paraphernalia for deep-sea and fishery research. Several years will be devoted to

the work, and it is believed that the investigations will constitute one of the most beneficent measures thus far taken by the United States government for the improvement of the industrial condition of the Filipinos.

THE ANGLO-AMERICAN POLAR EXPEDITION

THE following letter to Hon. O. H. Tittmann, Superintendent of the U. S. Coast and Geodetic Survey, describes some of the experiences of the Mikkelsen-Leffingwell expedition and the difficulties encountered by the explorer on the Arctic coast of Alaska:

FLAXMAN ISLAND, ALASKA,
VIA POINT BARROW,
August 16, 1907.

SIR: Our expedition to Banks Land has wound up here and I am endeavoring to make the most of the opportunity to add something to the meager knowledge of this region along geodetic and geologic lines. The program I hope to carry out consists of a map of the coast from Demarcation Point to the Coville River, the exploration of five rivers not now indicated on the map, four of them never visited by white men, and such geological work as I can do. The past year was devoted to expedition affairs and very little of the six months spent in the field was devoted to scientific work, so that to carry out the above program it will be necessary to remain another year. The expedition was supposed to be fitted for two years, and we have received some more provisions this summer, but we have used so much of our outfit in the purchase of dogs, furs, and fresh game that by the end of another year we shall be short on a good many things; consequently I am sending out for a third year's supply of provisions, coal, etc.

A part of the expedition returns this year, and next year I shall be alone and will be compelled to support a native family or two for hunters and to travel with me in the field; consequently I am in imperative need of the provisions. The only available way is to ship it in per whaler at a cost of from $25 to $50 per ton, and even then there is much uncertainty. This summer our stuff came in three different whaling ships. One landed her share; another had an injured propeller and was in a hurry to get to Herschell Island to have it repaired; the third had our freight buried under some tons of her own goods and refused to land it until she returned in September. A prospector 50 miles east of here, with whom I have been working in the mountains, had all his supplies carried by in a fog and will not get them until September.

In view of this uncertainty and of the excessive cost of freight, I wish to have my goods brought up by the revenue cutter *Thetis* on her annual trip north. She comes each year to Point Barrow, and this island is only 250 miles farther. I have already been at a personal expense of over $8,000 on this expedition, and, as I am doing work which would cost the government a large sum to duplicate, I feel that it is not asking too much to have supplies transported by the government. Personally I have made one trip (with mail) to Herschell Island, two trips to Baxter Sound surveying, one trip 80 miles into the mountains with pack on back, and spent two months on the ice to the north of here sounding and looking for supposed land. Other members of the expedition have been equally active, our ethnologist having been in the field nearly the whole winter working from the east mouth of the McKenzie River to the Corvette.

Of course, I am depending upon occultations for longitude, and brought along a two-inch telescope by Bausch and Lomb. I was at the ship only during two lunations, and on account of the almost continual gales succeeded in getting only one occultation of a 4.3 magnified star. I followed several smaller ones until nearly the calculated time, but always lost them before they were shut out. Try as I would, I could not keep the frost from my breath, hands, and even body from dimming and blurring the image.

I have an alt-azimuth by Gaertner, of Chicago, with a 12cm. circle (graduated by Berger), with which I can get a latitude observation with probable error of $\pm 1''.5$ with a set of eight pointings. The probable error of our observatory is about $\pm 0''.5$, mean of four sets. Last winter I had to use a siderial watch for time observations and found it very unsatisfactory; still the probable error of a time set on two stars, east and west, was generally about $0^s.5$. This last week I have changed our ship's chronometer to siderial time and I hope for better work this winter.

For work along the coast and sand reefs I have a small planetable with telescopic alidade furnished with an eye-piece micrometer mounted horizontally. By means of poles set up about 100m. apart I can carry a traverse which is to be corrected by latitude and longitude observations every 30 to 40 miles. The longitude I hope to carry toward Demarcation Point by latitude and a triangulation on the mountains to the west. The only way is to use chronometers in September, when the stars begin to show and navigation is still open.

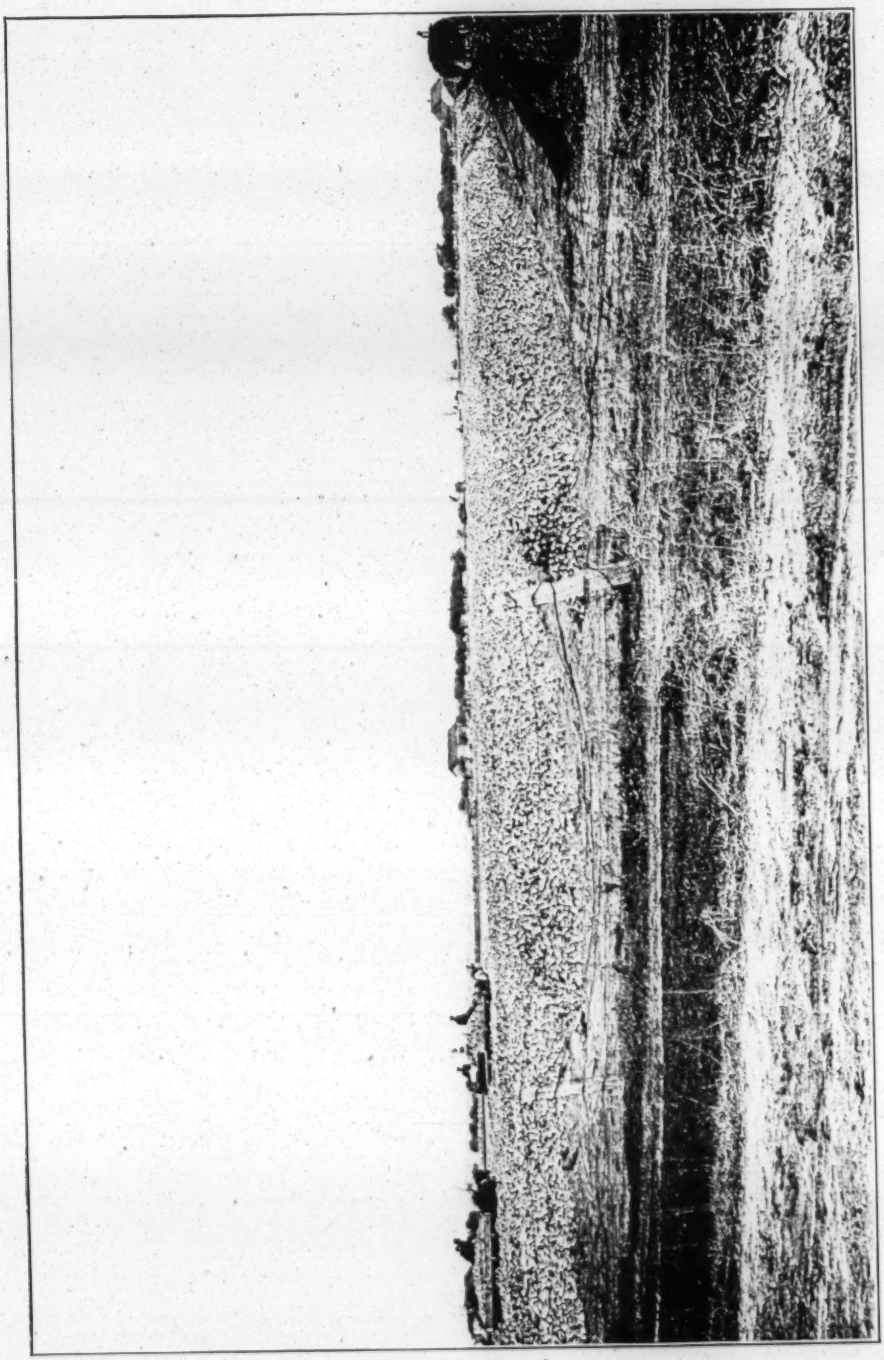
Very respectfully,

E. DE K. LEFFINGWELL.

California Indians Pounding Acorn Meal for Food

Photos from M. E. Jaffa, Dep't of Agriculture

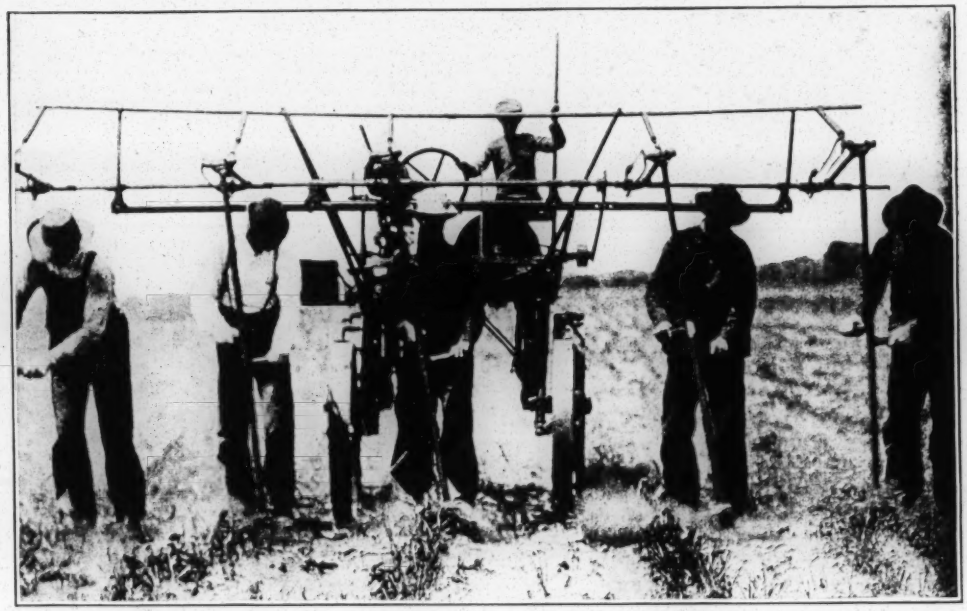
California Indian Leaching Acorns for Food



Immense Piles of Sugar Beets Awaiting Shipment to the Factory

Polish Women Thinning Beets in the West

These women walk two to four miles in the morning to their work and back in the evening. They are well paid and become very skillful. Photos from C. O. Townsend, Dep't of Agriculture



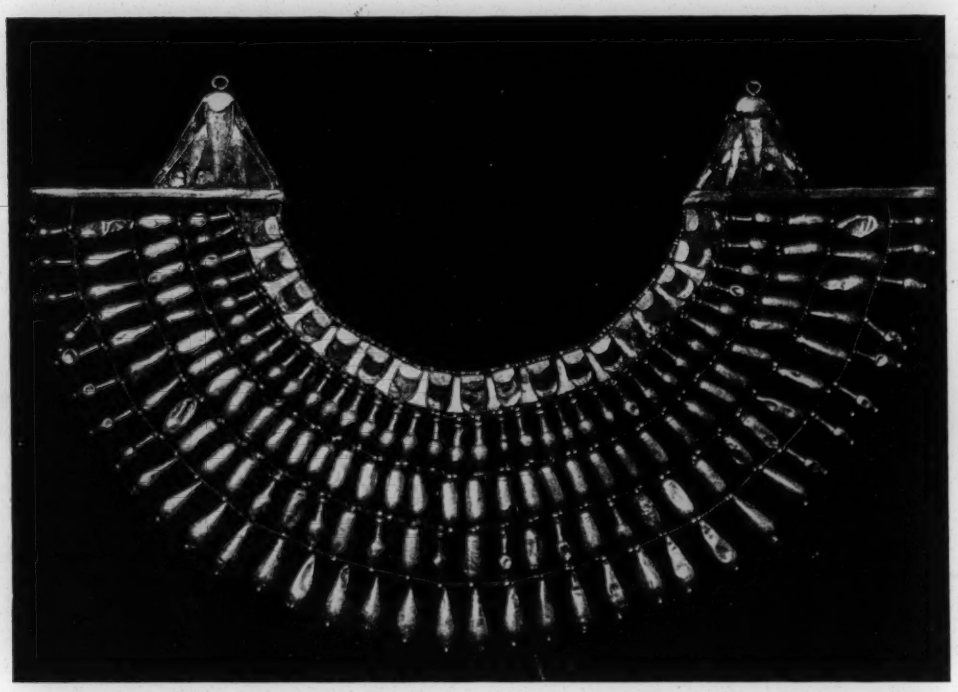
Power Hoe—Recently invented for use in the cotton fields, and which it is believed will prove equally successful in beet culture

NUTS AND THEIR USES AS FOOD

TO the last Year Book of the Department of Agriculture Prof. M. E. Jaffa, of the University of California, contributes an instructive article on the uses of nuts as food. The early explorers of America were much impressed by the extended use of nuts by the American Indians. The native hickories, butternuts, walnuts, chestnuts, and many other nuts found in the United States were gathered by the natives and formed one of their principal sources of food. The methods of preparing acorns for food, still followed by the Indians of northern California, are shown in the illustrations on page 797. The shelled nuts are split, dried, and ground with a mortar and pestle. The sifted flour is then placed in a hollow in the sand, on a convenient river bank, and leached to free it from the bitter principles present. From the leached meal a porridge or mush is made, which to the ordinary palate is much improved by the addition of salt. These typical Indian foods, when well prepared, are relished by many persons who have tried them, and it seems not improbable that improved methods of removing tannin and the bitter principles present in most varieties of acorns might result in the utilization of the acorn crop, which is fairly large and is generally wasted.

Lately the use of nuts has greatly increased in the United States, with the result that many persons are now growing native and foreign nuts on a commercial scale. The quantity of almonds, cocoanuts, Brazil nuts, filberts, peanuts, walnuts, and other nuts, shelled and unshelled annually imported into the United States is, in round numbers, 90,000,000 pounds with a value of $6,250,000. In 1905 the total almond crop in California reached 4,200,000 pounds and the walnut crop 12,800,000 pounds. The richest yield of peanuts was reported from the Southern States, chiefly Virginia, Georgia, and Tennessee, and amounted to 225,000,000 pounds.

XUM



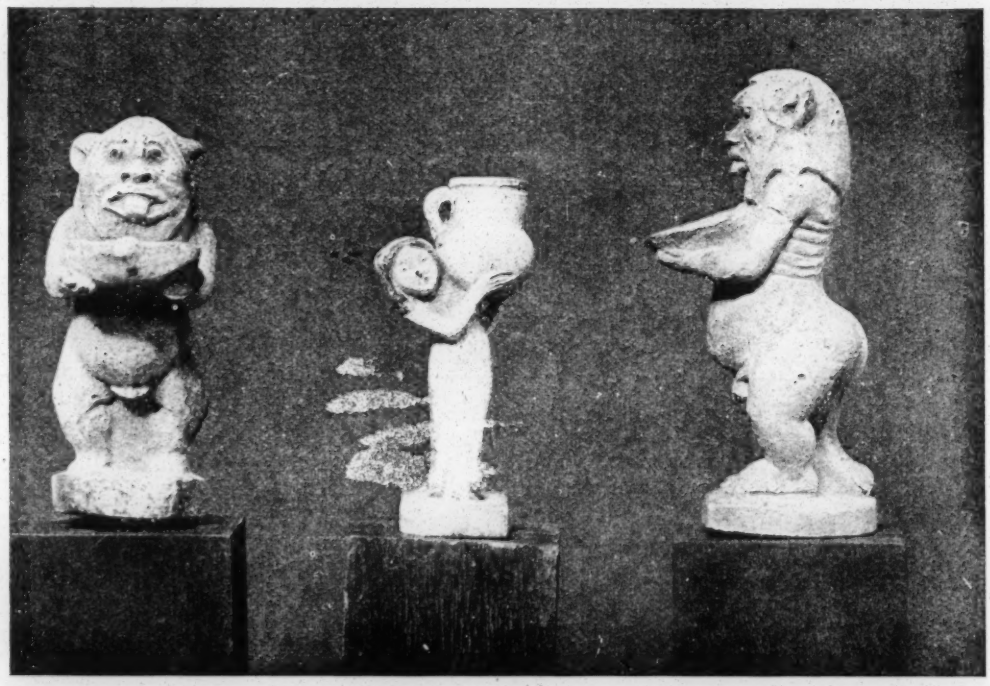
Gold Necklace Found by Mr Davis in the Tomb of Queen Tiyi, January, 1907

AMERICAN DISCOVERIES IN EGYPT

IN a recent address to the National Geographic Society, Mr Theodore M. Davis, of Newport, gave an interesting description of his discovery and opening of the tomb of Queen Tiyi in the Valley of the Tombs, Egypt, in January, 1907. Queen Tiyi was one of the most romantic personages in Ancient Egypt, and, though not of noble birth, because of her beauty became the Queen of Amenhotep II. She ruled at a time when Egypt was at the height of its fame and wealth, and both she and her husband vastly increased the power of the kingdom. Queen Tiyi, however, was not sympathetic with the ancient religion, and through her influence her son, Akhnaton, who ruled for nearly thirty years, abandoned the Egyptian gods and endeavored to establish a belief in one God. According to Mr Davis, Akhnaton was the first ruler in authentic history who argued that there was only one God. His influence was, however, unfortunate from a material point of view, as he lived in seclusion and devoted himself almost entirely to meditation, with the result that the empire dwindled away during his reign.

The mummy of Queen Tiyi was found in a golden coffin made in human form and richly studded with jewels and precious stones. A vulture diadem of gold was placed around her head and the body wrapped in sheets of gold. The tomb contained four canopic vases containing the queen's heart and intestines, beautiful alabaster vases and dishes, and exquisite inlaid furniture.

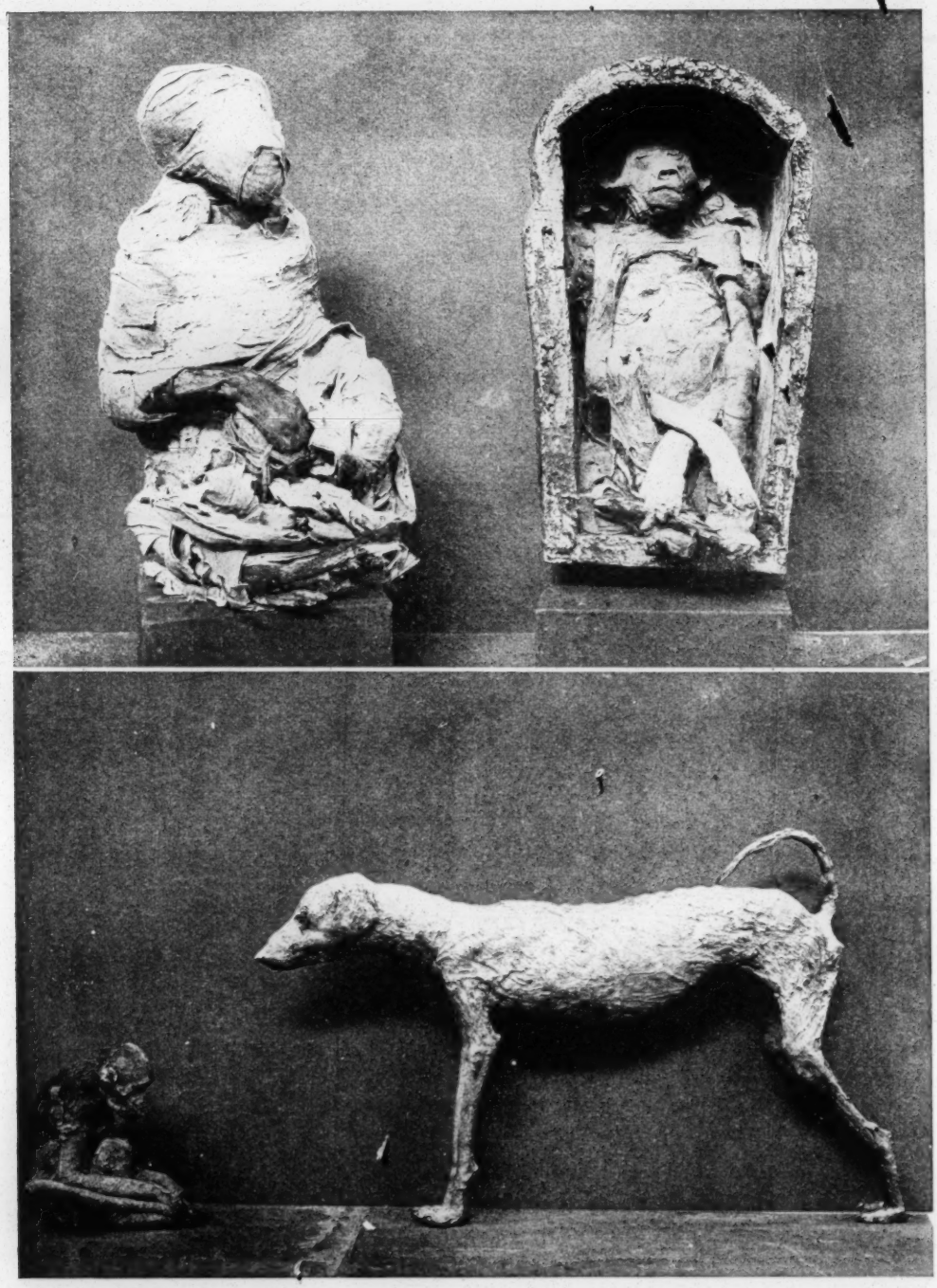
Mr Davis is a man of means, who at his own expense has been carrying on explorations in Egypt for nearly 20 years. Two years prior to this last discovery he found the tombs of Queen Tiyi's father and mother, Uaa and Tuaa. His work is done solely for the benefit of science and the joy of discovery, as all his discoveries become the property of the Museum at Cairo.



Canopic Heads of Queen Tiyi and other Objects, Found in Her Tomb by Mr Davis in January, 1907

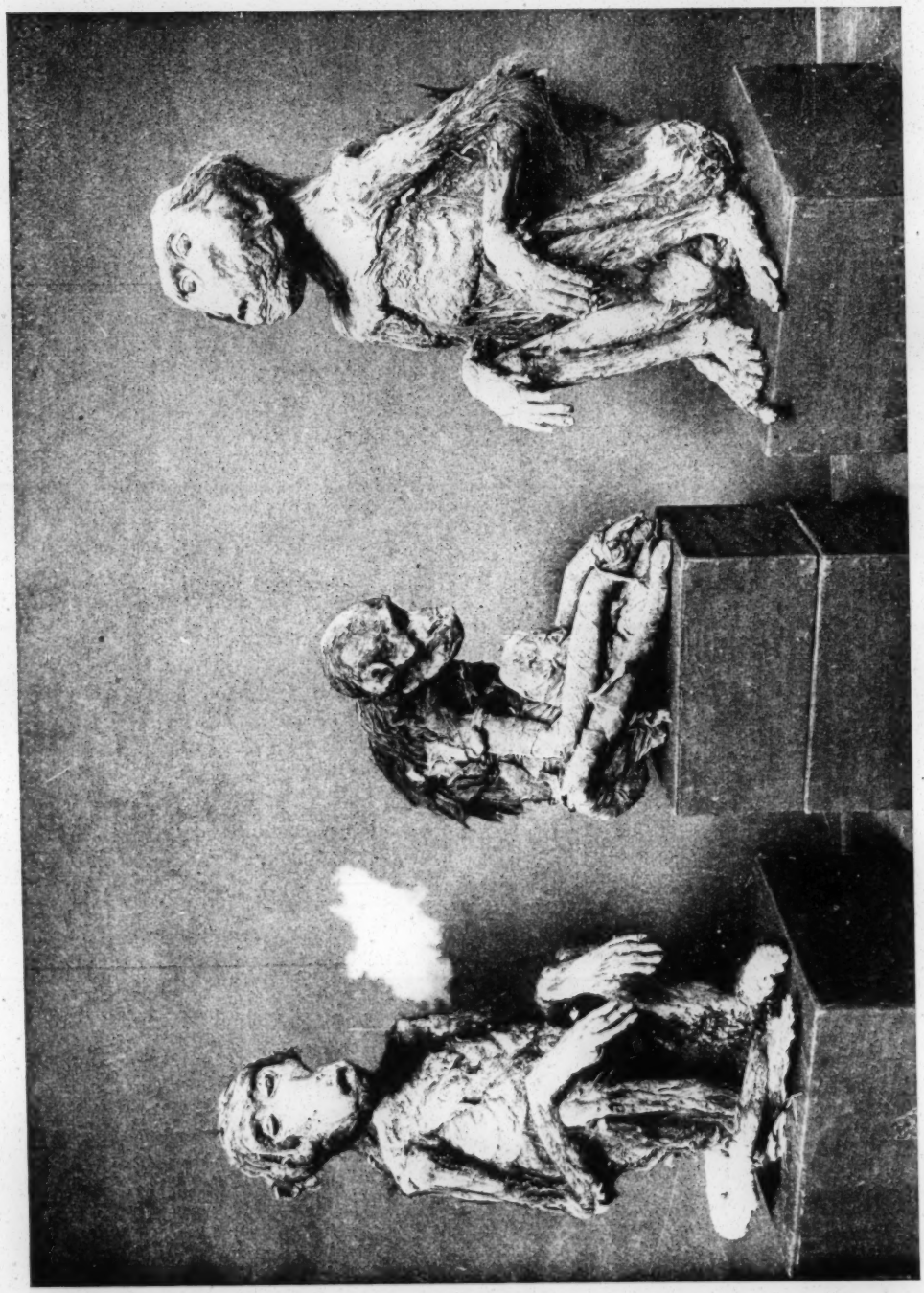
Head of Queen Tiyi Found in Her Tomb by Mr Davis

The Golden Vulture Found on the Head of Queen Tiyi



Mummefied Monkeys and Dog Found by Mr Davis in the Tomb of Amenhotep II

This king was very fond of monkeys, and when he died his pets were placed near him



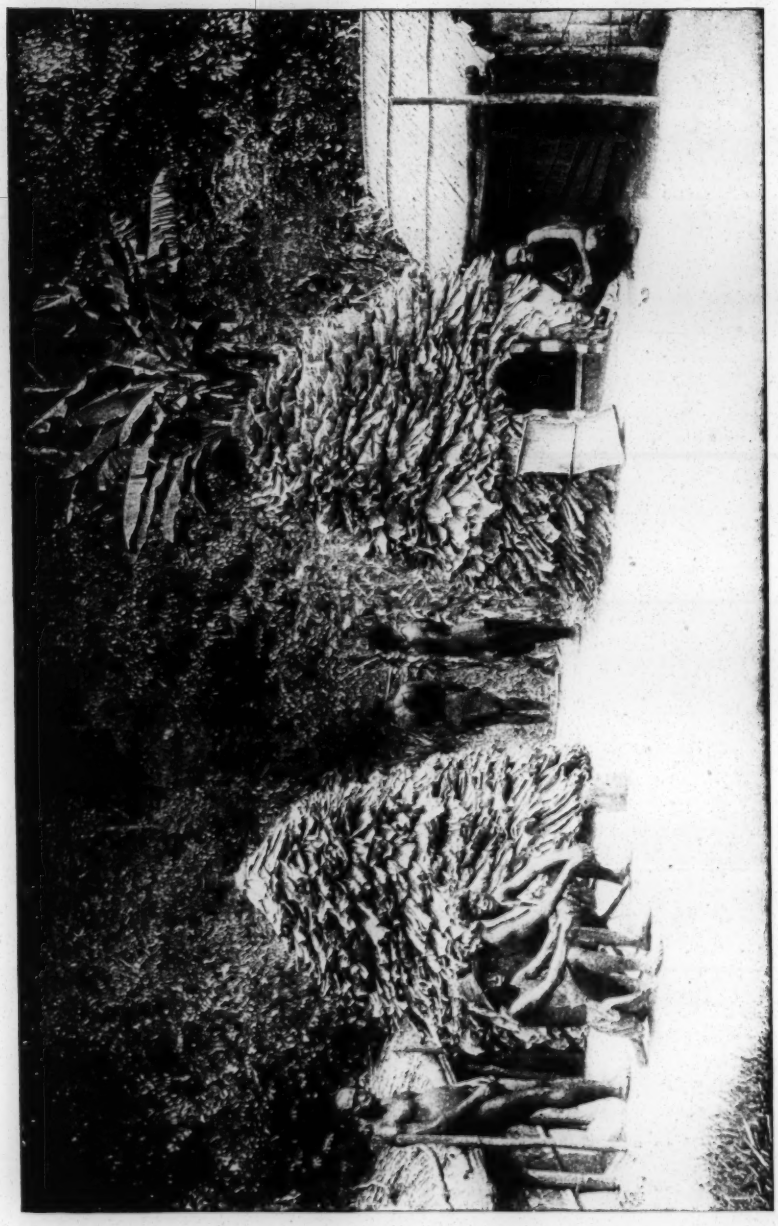
Mummified Monkeys Found by Mr Davis in the Tomb of Amenhotep II

Other curious contents of the tombs were mummified ducks and chickens. These were preserved in wooden vessels, carved to represent the bird they contained. Another vessel contained delicious honey, which had been there for thousands of years

Cicatrised Batetela Woman (Lualaba-Kassai)

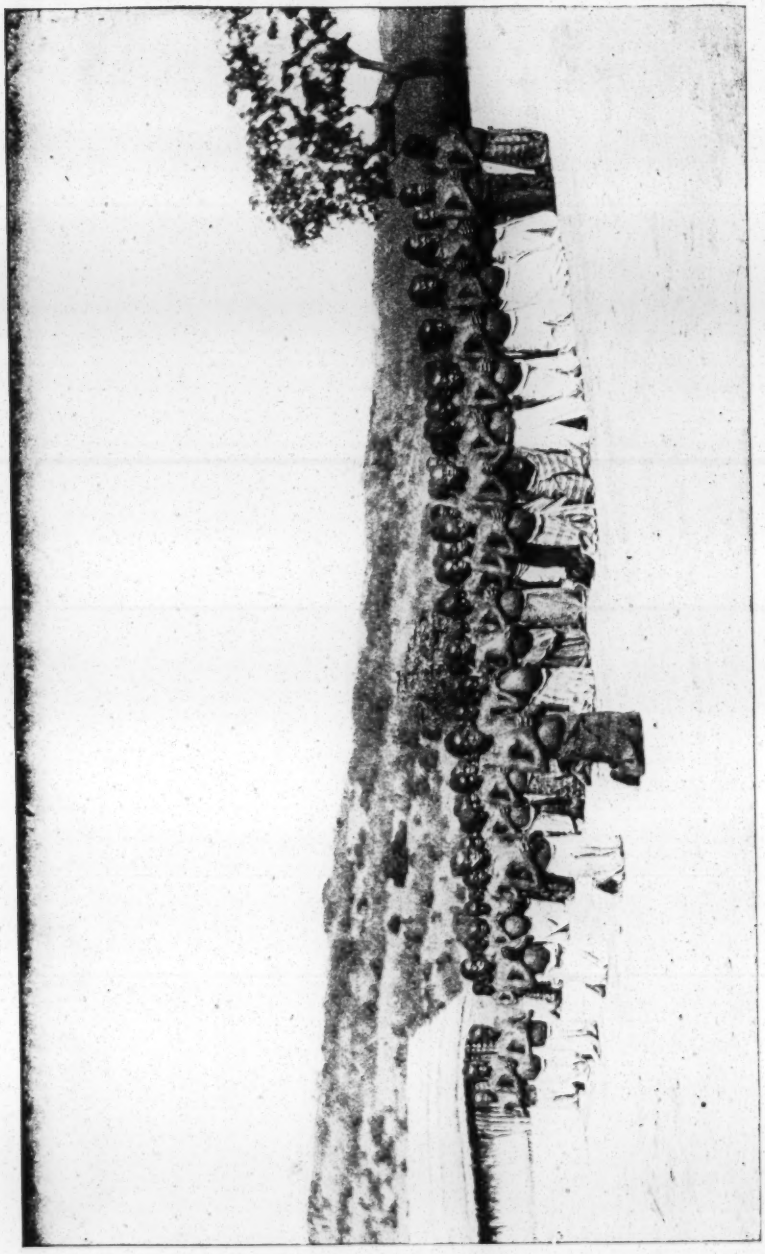
Specimens of Hairdressing Among Women of the Sango Banzyville (Ubanghi)

From "The Story of the Congo Free State." Copyright by Henry Wellington Wack



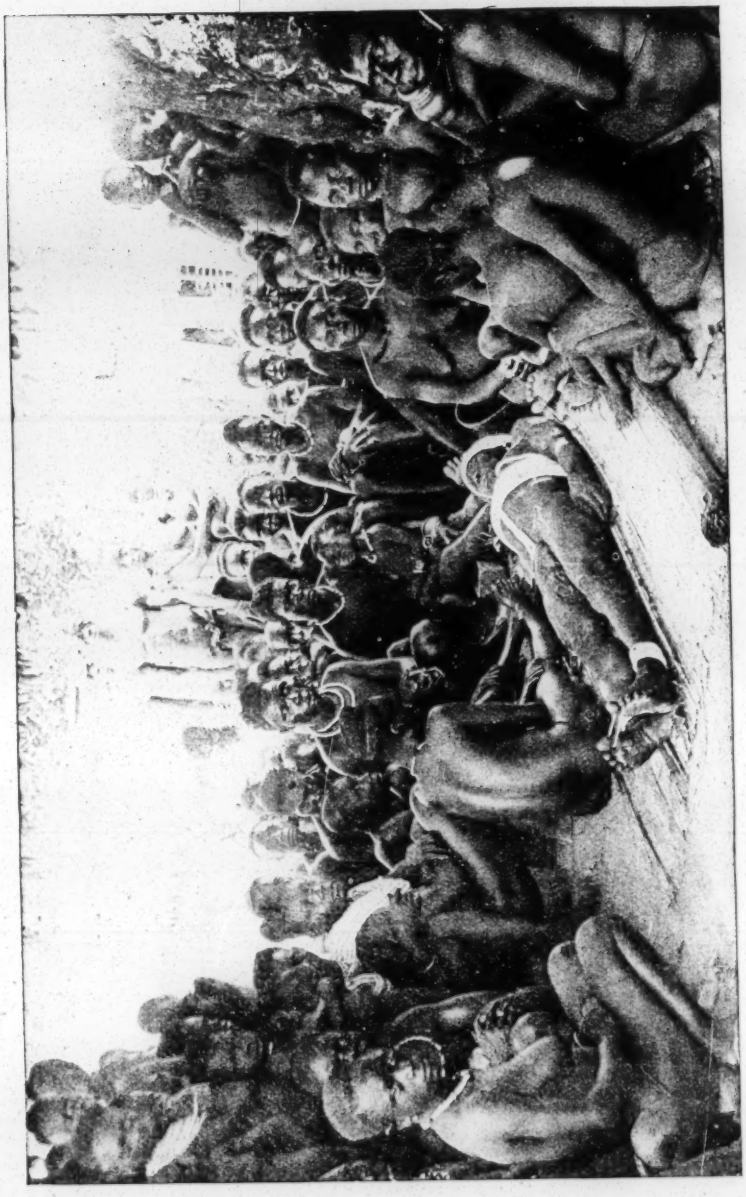
Native Huts Built of Leaves (Aruwimi)

From "The Story of the Congo Free State." Copyright by Henry Wellington Wack



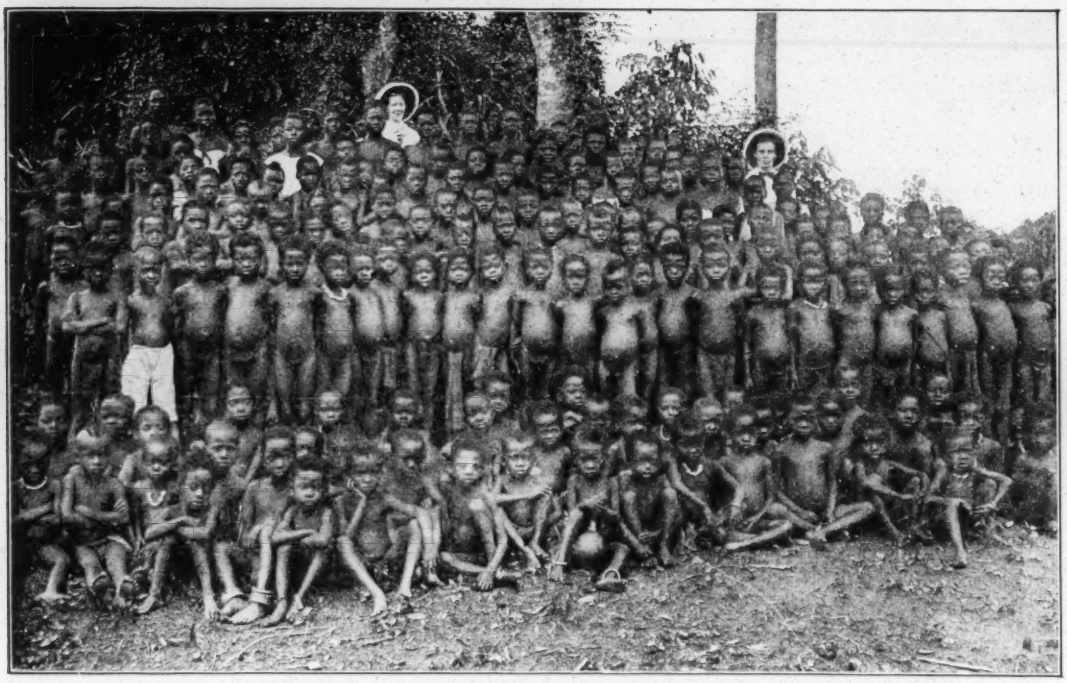
Children of the Settlement School at Boma Praying

From "The Story of the Congo Free State." Copyright by Henry Wellington Wack



Funeral at Bumba (Bangala)

From "The Story of the Congo Free State." Copyright by Henry Wellington Wack



English Missionaries and Some of their Charges

From "The Congo and Coasts of Africa." Copyright by Richard Harding Davis

THE TRUTH ABOUT THE CONGO*

WE have been hearing so much in the last several years of cruelties and slavery in the Congo Free State that three volumes just published on this part of the world will prove very welcome. The authors do not agree in their conclusions. Mr Wack had free access to all the archives of the Belgian government, with permission to read private and secret reports from governors in the Congo Free State. Dr Frederick Starr lived for nearly a year in the Congo Free State, traveling 15,000 miles on its rivers. Mr Richard Harding Davis spent several weeks in the Congo regions and the neighboring colonies of French Cameroon.

Mr Davis declares that the worst stories told of Belgian cruelties and murder fall far short of the actual atrocities taking place, while both Mr Wack and Dr Starr emphatically deny these outrages, and it must be admitted that they present a much stronger case. They admit that there are occasional instances of misgovernment in the Congo, as in every part of the world, but they assert that as a whole the government is considerate, wise, and effective.

To quote from Dr Starr:

"Of course, I saw much to criticise. It is true that there are floggings, and chain-gangs, and prisons. I have seen them all repeatedly. But there are floggings, chain-gangs, and prisons in the United States. Mutilations are so rare that one must seek for them; and I had too much else to do.

*The Story of the Congo Free State. By Henry Wellington Wack. With 125 illustrations and maps. Pp. 634. G. P. Putnam's Sons.

The Truth about the Congo. By Dr Frederick Starr. With illustrations. Pp. 129. Forbes & Co. (Chicago).

Congo and the Coasts of Africa. By Richard Harding Davis. With illustrations. Pp. 220. Charles Scribner's Sons.

The Salt Plain of Lop

From "The Pulse of Asia." Copyright by Ellsworth Huntington

"Of frightful outrages, such as I had expected to meet everywhere, I may say there was nothing.

"On the contrary, I found at many places a condition of the negro population far happier than I had dreamed it possible. The negro of the Congo—or Bantu, if you please—is a born trader. He is imitative to a degree. He is acquisitive and charmed with novelties. He is bright and quick, remarkably intelligent. He readily acquires new languages, and it is no uncommon thing to find a Congo Bantu who can speak six or seven languages besides his own. In disposition variable and emotional, he quickly forgets his sorrow. I saw hundreds of natives who were working happily, living in good houses, dressing in good clothes, of European stuff and pattern, and saving property. That this number will rapidly increase I have no doubt."

Mr Wack is equally positive:

"The growth of the Congo Free State has from the first been skillfully directed by clever men of thought and action. Now that the transformation is complete, and what but three short decades ago was the very heart of savagery has become a valuable commercial and political asset, the forcible ejectment from the African Continent of the authors of all this good is openly discussed! Such is the reward which it is proposed should be meted out to the gallant, self-sacrificing little nation which has replaced the horrors of barbarism by the blessings of civilization, and incidentally discovered vast material wealth."

Mr Wack also describes the political, social, and economic aspects of the Belgian system of government and the almost boundless natural wealth of the Congo Free State: "The forests of the Congo are the finest in the world. They contain a great variety of hard and soft wood, fruit-bearing trees, rubber trees and vines and gum trees and constitute an industrial wealth which is being preserved by enforcing rigorous laws." The Free State is one-third the size of the United States. It lies squarely across the heart of Africa with an outlet to the sea on the west coast, which brings it comparatively near the European markets. It separates the British African Empire—the Soudan and the Nile country on the north from the Cape and Rhodesia territory—in a manner most aggravating to the British. As Mr Wack puts it, the British statesman who is ambitious to develop his country's influence in Africa, feels as an American would who saw the Louisiana Purchase territory owned by a small foreign power.

GEOGRAPHICAL BOOKS OF 1907

The South Americans. The story of the South American Republics, their characteristics, progress, and tendencies: with special reference to their commercial relations with the United States. By Albert Hale, A. B., M. D. Pp. 361. 9 x 5⅞ inches. Illustrated. Indianapolis: The Bobbs-Merrill Co. 1907.

Dr Hale lived many years in South America, visiting every country he describes. He makes many startling statements of the wonderful possibilities of the continent. For instance, speaking of the 800,000 square miles of Argentina embraced in the basin of the Parana, he says:

"Nearly every acre of this land in Argentina is, with the simplest of railway construction, within reach of the Atlantic Ocean. There are no natural barriers to overcome, such as we have in the Alleghanies on the east, or in the Rockies on the west. Produce that cannot be floated down a river to tide-water could be loaded on to cars and with slight expense and a short haul be mechanically transferred to modern ships in modern harbors, with the whole consuming world of Europe closer to their producing areas than are the fields of our Middle West. How immense are these storehouses of nature and how close to markets can scarcely be grasped except by a close study of their geography."

The Continent of Opportunity. The South American Republics—their history, their resources, their outlook. Together with a traveller's impressions of present-day con-

Bedouin Woman and Child

From "Nigeria, Our Latest Protectorate," by C. H. Robinson

ditions. By Francis E. Clark. Pp. 349. 5½ x 8⅜ inches. Illustrated. New York: Fleming H. Revell Co. 1907.

Perhaps the best chapter in Dr Clark's admirable account of his five months' journey around South America is that on "Brazil—the Boundless."

"Brazil owes its predominant importance among the South American States to the productiveness of its soil and the variety of its resources quite as much as to its vast size. It is not too much to say that every product that makes for the comfort and wealth of mankind is found in Brazil. Coffee, sugar, cotton, rubber, corn, wheat, diamonds, gold, are only a few of her products, and the undeveloped and even unexplored wealth of the country is infinitely greater than that which can be catalogued.

"The country rises abruptly, but not inaccessibly from the shore for hundreds of miles, and the table-lands that lie back from the coast at a height of two or three thousand feet enjoy all the blessings of a temperate climate, even when they lie within the tropics. Moreover, the rainfall throughout almost the entire length and breadth of Brazil is sufficient to produce the most luxuriant vegetation in the world, a luxuriance which led Amerigo Vespucci, the navigator who gave his name to both continents, to say that 'if Paradise did exist on this planet, it could not be far from the Brazilian coast,' while Agassiz believed that 'the future center of the civilization of the world would be in the Amazon Valley.'

"The contrast in respect to verdure and vegetation between the east and west coasts of South America is as the difference between the garden of Eden and the desert of Sahara. On the west coast for twenty-five hundred miles one scarcely sees a tree or a blade of grass—only sand-swept mountains, grand and impressive, to be sure, but forbidding in the extreme. Throughout the vast coast line of Brazil one can hardly conceive how another blade of grass could grow or another tree could stand in the crowded, luxuriant vegetation that now occupies the soil."

The Andes and The Amazon. Life and travel in Peru. By C. Reginald Enock. Pp. 370. 9¼ x 6 inches. Illustrated. Map. New York: Imported by Charles Scribner's Sons. 1907. $5.00 net.

An eloquent and sympathetic account of ancient and modern Peru:

"Peru is a country covered with a certain halo of romance—the romance of history; of that time when continents were found, taken, and explored; the romance of a civilized and little known race—the Inca—extending back before the keels of those old caravels from Europe ploughed the seas of the New World; the romance of the Spaniards, picturesque and cruel; the romance of Nature in her most stupendous operations, her Andean and Amazonian handiwork.

"Peru contains all the products of the tropical, semi-tropical, and temperate zones and her 1,400 miles of Pacific littoral, and situation upon the largest system of navigable waterways in the world—the Amazon and its affluents—must some day cause her to become the center of a busy and extensive population.

"Peru is a country of large things; it has one of the greatest mountain ranges in the world—the Andes; it has the longest river system—the Amazon and its affluents—and the

most extensive forests; it has some of the highest peaks on the globe, and many of its mineral deposits are, of their kind, the largest in the world. From all this greatness of nature shall not there spring some day greatness of man—a leader of nations of her race and in her hemisphere?

Chile: Its history and development, natural features, products, commerce, and present conditions. By G. F. Scott Elliot. With an introduction by Martin Hume. Pp. 341. 9 x 5⅞ inches. Illustrated. Bibliography, appendix, and map. New York: Charles Scribner's Sons. 1907.

This is the best book on Chile published in some years. The peculiar geographical formation of the country "extending, as it does, in a narrow strip hemmed in by mountains, and embracing every variety of climate from the rainless Atacama to the rainy Magallanes, marks it out as the future dominant sea-power of South America. Its fine bays and harbors, its abundant coal supplies, and, not least, the ideal conditions of the south for producing a hardy, sea-faring race, ensure the perpetuation of the tradition that Chile is to be the mistress of the southern seas in the ages yet to come. But its vast, fertile plains, where every product of the temperate clime grows luxuriantly, its immense herds of cattle, its abounding mineral wealth, as yet hardly touched, the vast, stretching, virgin forests upon its mountain slopes, its inexhaustible fisheries, and, above all, its laborious, hardy population, destine it to attain national greatness and wealth on land as well as on sea. All that Chile needs is time and peace to become one of the great nations of the world."

Mexico and Her People of Today. An account of the customs, characteristics, amusements, history, and advancement of the Mexicans and the development and resources of their country. By Nevin O. Winter. Pp. 405. 8¼ x 5¾ inches. Illustrated. Boston: L. C. Page & Co. 1907.

This book is a concise and entertaining description of the country as it appears to the visitor. Mr Winter says:

"The accomplishments of the past twenty years in Mexico are marvelous. Americans who have lived there during that time wax eloquent in describing the great change for the better. Whereas formerly people hesitated to invest money for fear of political changes, now investments are as safe there as in any other country, and the Mexican securities have a fixed value on the bourses of the world.

"Modern luxuries and conveniences are being introduced everywhere. The people are simply installing in a hurry the things that other countries have been acquiring for half of a century. Every city is bestirring herself, and electric light plants, modern sewerage systems, and water works are being constructed.

"The development of the water power of the Republic is now commanding considerable attention. The greatest undertaking attempted as yet is that which is now nearly finished, in which the Necaxa falls are utilized. The transmission lines reach a length of 171 miles. When completed this plant will have a capacity of 200,000 horse-power, and will supply the City of Mexico, Puebla, and other cities with cheap and unlimited power. Other waterfalls are awaiting development, and it may be that the energy of nature will supply the great need of Mexico for a cheap and satisfactory power to develop her other resources."

Recollections of An Ill-fated Expedition to the Headwaters of the Madeira River, in Brazil. By Neville B. Craig. Pp. 474. 9 x 5⅞ inches. Illustrated. Maps. Philadelphia: J. B. Lippincott Co. 1907.

Guide to Modern Peru. Its great advantages and vast opportunities. By A. de Clairmont, M. D., Consul of Peru. Pp. 66. 5½ x 7¾ inches. Illustrated. Toledo, Ohio. 1907.

An interesting publication distributed by Dr Clairmont free of charge.

How to Prepare for Europe. A handbook of historical, literary, and artistic data, with full directions for preliminary studies and traveling arrangements. By H. A. Guerber. Pp. 527. 6¾ x 4⅜ inches. Illustrated. Maps. New York: Dodd, Mead & Co. 1907.

This volume is heartily recommended as an advance guide to all who contemplate a trip to Europe. It contains many maps and a list of good books on each country. The general reader who desires the best mental and material preparation for such a journey will find this handbook indispensable.

The European Tour. By Grant Allen. Pp. 297. 7¼ x 4¾ inches. New York: Dodd, Mead & Co. 1906.

The Highlands and Islands of Scotland. Painted by W. Smith, Jr. Described by A. R. Hope Moncrieff. Pp. 232. 9 x 6⅛ inches. Illustrated. Map. London: A. & C. Black. American agent: The Macmillan Co. 1906. $3.50 *net.*

England and the English. An interpretation. By Ford Madox Hueffer. Pp. 354. 8⅛ x 5¾ inches. Illustrated. New York: McClure, Phillips & Co. 1907.

The Red Reign. The true story of an adventurous year in Russia. By Kellogg Durland. Pp. 533. 8½ x 5¾ inches. Illustrated. New York: The Century Co. 1907. $2.00 *net.*

During the five months ending March 5, 1907, according to an official statement, says Mr Durland, 764 persons were executed in Russia for political crimes and activities, or an average of 5 a day. When the reader realizes that the executions by guillotine in France during the Terror were only 2,300, the appropriateness of the author's title, "The Red Reign," is evident. The revolution will probably last for many years, but the ultimate triumph of the people is inevitable. Mr Durland's narrative is dramatic in the extreme, and probably is as fair and accurate a picture of present political conditions in Russia as has been written.

"Since October, 1905, the Russian people have advanced enormously, and the Duma experiments, handicapped as they were, have yet proved immense educational influences; they have served to arouse the whole people to what may be, and to awaken within them a realization of what sooner or later must be. On this count alone the value of these short-lived parliaments must not be underrated. The Russian people now understand their own situation as they never have grasped it before. They have not merely lost faith in the Czar; they have learned that the trouble with Russia today is that it suffers a blight, and that blight is autocracy, which in its very essence is incompatible with modern civilization, and that while the obliteration of autocracy may be a long task, the only escape from their present bondage is the accomplishment of this task; and the period of the struggle making for this end will be recorded in history as the Russian Revolution."

Poland: the Knight Among Nations. By Louis E. Van Norman. With an introduction by Helena Modjeska. Pp. 359. 8½ x 5¾ inches. Illustrated. New York: Fleming H. Revell Co. 1907. $1.50 *net*.

In view of the hundreds of thousands of Poles who have been coming to the United States in recent years, this excellent description of that remarkable race will prove of value to all students of our immigration and citizenship problems.

"If the Polish eagle has never yet been tamed; if it bears its captivity and its wounds, but refuses to become domesticated, it is because the Polish women have nursed it and kept before it the scent of the upper air and the love of liberty. If no prescription has as yet been discovered for making a Russian or a German out of a Pole, it is because the Polish women have kept the fountain head of the national life pure and incorruptible. Frederick the Great once said, "In Poland the women attend to politics, while the men get drunk."

"As among all original Slav races, the Polish woman of the lower classes has not yet emerged from the physical and mental slavery of former ages. Among the Polish peasants, as among the Russians, she is valued chiefly for the work she can do and for the number of children she can bear. What little freedom and happiness she has ceases after marriage, and a peasant woman, old, stooped, and haggard at twenty, with a heavy, stupid child in her arms, wearily tramping the muddy road of some village, or driving the cows afield in the pelting rain, is a sight to personify "dull care," a typical "woman with the hoe."

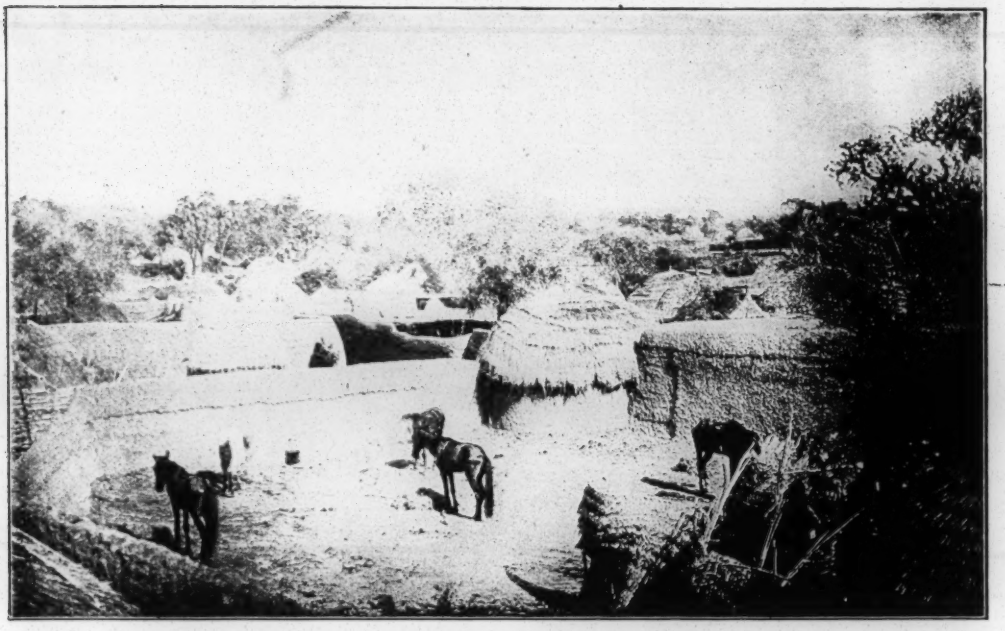
"The Poles grow up and become good Americans. The Polish immigrants spread over our great West, and the cities of Buffalo, Chicago, Milwaukee, Pittsburg, Cleveland, Philadelphia, Detroit, and Toledo are the main centers in which they congregate. In Chicago alone there are more than 250,000 of them, forming the largest Polish city in the world after Warsaw and Lodz. They come from all sections of the former commonwealth, but principally from Galicia. They are, in general, industrious, frugal, and soon amass a competency. Comparatively few professional men or members of the upper social classes have come to this country except for political reasons. The following is the Polish population in the United States (I quote even thousands), a total of somewhat over 2,000,000:

Pennsylvania	423,000
Illinois	389,000
New York	356,000
Wisconsin	198,000
Michigan	161,000
Massachusetts	129,000
Ohio	96,000
New Jersey	93,000
Minnesota	89,000
Connecticut	61,000
Indiana	41,000
Missouri	21,000
Maryland	19,000
Nebraska	19,000
Texas	18,000"

The Whirlpool of Europe. Austria-Hungary and the Habsburgs. By Archibald R. Colquhoun and Ethel Colquhoun. Pp. 349. 8¾ x 6 inches. Illustrated. Maps and diagrams. New York: Dodd, Mead & Co. 1907.

Nowhere else in Europe is the past so intermingled with the present, and under the Emperor-King Francis Joseph one may study at the same time every phase of European civilization, and every kind of question—racial, political, and social—which has agitated Europe in the last two centuries.

The Alfold, the richest agricultural land of Hungary, is the great central plain, the largest in Europe, and the dwellers in this region are passionately attached to their wide spaces and distant horizons, which they prefer to the most majestic mountain scenery. Even the extreme cold of the winter, when the sea of gold is



A Typical Hansa Village in Nigeria
From Nigeria "Our Latest Protectorate," by C. H. Robinson

turned into a frozen lake, does not shake their allegiance; and indeed this fertile alluvian plain is a true mother to the Magyar race, and in its situation and conditions lies the key to much that is wonderful in the history of the nation it shelters. A fertile soil, genial climate, and a splendid system of waterways make it one of the picked spots of Europe, and the development of the Magyar race took place under fortunate circumstances. It is well that they repay their motherland with the affection that is her due, for she has been the source of their prosperity and unity.

The size of the estates of the Hungarian aristocracy, churches, and municipalities is phenomenal. Altogether they occupy not less than 40 per cent of the land, while several estates count more than 57,000 hectares (140,790 acres) and one or two as much as 228,000 hectares (563,160 acres). The nobles of the second rank own only 14 per cent of the land, while there is a peasant proprietor class, numbering about two millions, which owns 46 per cent of the land.

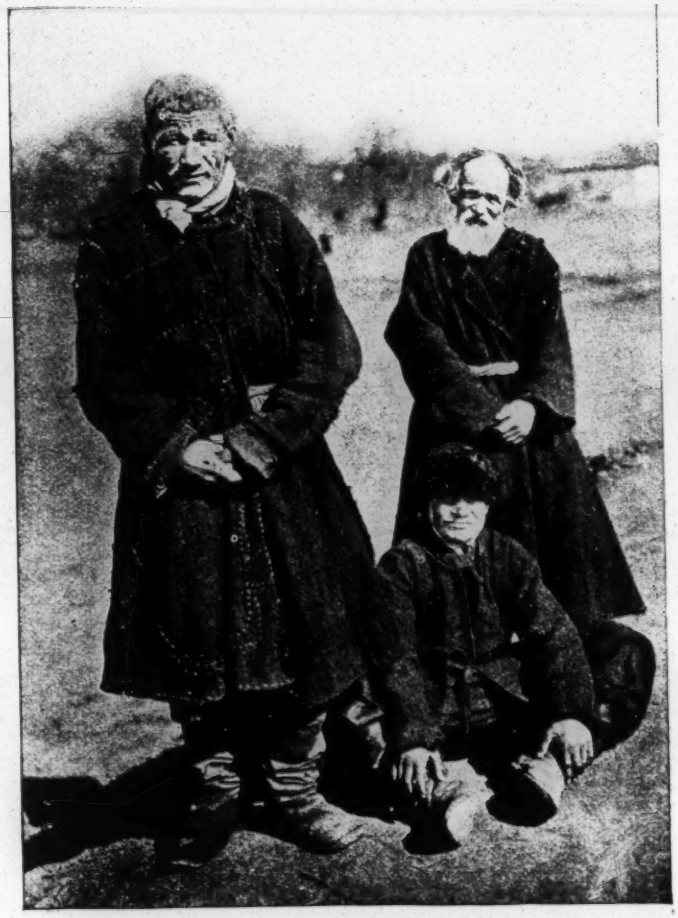
The Magyar peasant woman does not, as a rule, work in the fields. Her business is to keep the home, for the Magyar prizes comfort and insists on a certain standard of it. As a consequence the peasant houses in most agricultural districts are clean and tidy, and on the Alfold they are generally perfect models of order and cleanliness. Every self-respecting Magyar housewife wants to have a room in her tiny house on which she lavishes her skill in needlework. The great criterion of respectability is the number of embroidered pillows in this spare room, and some cottages boast as many as eight or nine of these coveted possessions.

The numerous illustrations and maps are admirable, and altogether "The Whirlpool of Europe" makes one of the most useful publications of 1907.

Through Savage Europe. Being the narrative of a journey undertaken as special correspondent of the Westminster *Gazette* throughout the Balkan States and European Russia. By Harry de Windt. Pp. 300. 9 x 5⅞ inches. Illustrated. Philadelphia: J. B. Lippincott Co. 1907.

The Balkan Trail. By Frederick Moore. Pp. 296. 8½ x 5½ inches. Illustrated. Map. New York: Macmillan Co. 1907.

The France of Today. By Barrett Wendell. Pp. 379. 8¼ x 5½ inches. New York: Charles Scribner's Sons. 1907. $1.50 *net.*



Peasants of "Little Russia"

From "Savage Europe." Copyr ight by J. B. Lippincott Co. 1907

Holland Sketches. By Edward Penfield. Pp. 147. 9¾ x 7¼ inches. Illustrated. New York: Charles Scribner's Sons. 1907.

The thirty beautifully-colored pictures contained in this volume illustrate the picturesque in Holland.

Italy, the Magic Land. By Lillian Whiting. Pp. 457. 8¾ x 6 inches. Illustrated. Boston: Little, Brown & Co. 1907.

The Riviera. Painted and described by William Scott. Pp. 232. 9 x 6½ inches. With 75 colored illustrations. New York: The Macmillan Co. 1907. $6.00.

Russia and Reform. By Bernard Pares, M. A. Pp. 576. 9 x 5¾ inches. New York: E. P. Dutton & Co. 1907.

Greece and the Ægean Islands. By Philip Sanford Marden. Pp. 385. 8½ x 5¾ inches. Illustrated. New York: Houghton, Mifflin & Co. 1907. $3.00.

Greece. Painted by John Fulleylove. Described by the Rev. J. A. McClymont. Pp. 227. 9 x 6½ inches. Illustrated. New York: Macmillan Co. 1907.

Constantinople. Painted by Warwick Goble. Described by Alexander van Millingen. Pp. 282. 9 x 6½ inches. Illustrated. Map. New York. Macmillan Co. 1907.

The illustrations have been badly chosen, giving only a faint impression of one of the most fascinating cities of the world. The text, however, is interesting and authentic.

Algiers and Beyond. By M. W. Hilton-Simpson. Pp. 295. 5¾ x 8¾ inches. Illustrated. New York: D. Appleton Co. 1907.

Big Game Shooting on the Equator. By Captain F. A. Dickenson. With an introduction by Sir Charles Norton Eliot. Pp. 285. 9⅛ x 6 inches. Illustrated. New York: John Lane Co. $4.00.

In Wildest Africa. By C. G. Schillings. Translated by Frederic Whyte. Pp. 711. 9½ x 6½ inches. Illustrated. New York: Harper & Brothers. 1907.

Admirers of "Flashlights from the Jungle," undoubtedly the most remarkable book of wild life ever published (see NAT. GEOG. MAG., August, 1907), will be disappointed in this second volume by Mr Schillings, which evidently consists of pictures discarded by the first publication.

Across Widest Africa. An account of the country and people of Eastern, Central, and Western Africa as seen during a twelve months' journey from Djibuti to Cape Verde. By A. Henry Savage Landor. 2 vols. Pp. 396 + 500. With 160 illustrations and map. 7 x 10 inches. New York: Imported by Charles Scribner's Sons. 1907.

Le Plateau Central Nigerien. Une mission Archéologique et ethnographique au Soudan français. By Lieut. Louis Desplagnes. Pp. 500. 6½ x 10 inches. With 236 illustrations and map. Paris: Emile Larose. 1907.

Queer Things About Persia. By Eustache de Lorey and Douglas Sladen. Pp. 381. 9¼ x 6½ inches. Illustrated. Philadelphia: J. B. Lippincott. 1907. $3.50.

The Unveiled East. By F. A. McKenzie. Pp. 347. 8¾ x 6 inches. Illustrated. Maps. New York: E. P. Dutton & Co. 1907. $3.50.

China and America Today. A study of conditions and relations. By Arthur Smith. Pp. 239. 7¾ x 5¼ inches. New York: Fleming H. Revell & Co. 1907.

A Handbook of the Philippines. By Hamilton M. Wright. Pp. 429. Illustrated. Maps. Chicago: A. C. McClurg & Co. 1907. $1.40.

Everyday Life Among the Headhunters. And other experiences from east to west. By Dorothy Cator. Pp. 212. 7¾ x 5¼ inches. Illustrated. New York: Longmans, Green & Co. 1905.

Lotus Land. Being an account of the country and the people of Southern Siam. By P. A. Thompson. Pp. 312. 9 x 6 inches. Illustrated. Map.

The Voyage of the "Discovery." By Captain Robert F. Scott. Vol. 1, pp. 210. Vol. 2, pp. 387. 8¼ x 5½ inches. Illustrated. New York: Charles Scribner's Sons. 1907. 2 vols. $3.00.

This is an inexpensive edition of Captain Scott's remarkable book, reviewed at length in this magazine in February, 1907.

Fiji and Its Possibilities. By Beatrice Grimshaw. Pp. 315. 9⅝ x 6½ inches. Illustrated. New York: Doubleday, Page & Co. 1907. $3.00 *net.*

The Use of the National Forests. By Gifford Pinchot, U. S. Department of Agriculture. Pp. 42. 7⅛ x 5 inches. Illustrated. 1907.

The object of this little book is to explain what our forest reserves mean, what they are for, and how to use them.

How the World is Fed. By Frank G. Carpenter. Pp. 362. 7½ x 5¼ inches. Illustrated. New York: American Book Co. 1907.

The author takes the reader on personally conducted tours to the great food centers of the world, to the markets of exchange, to the factories, the farms, the forests, and the seas. Interesting for old and young.

Statistical Abstract of the World. By Henry Gannett. Pp. 84. 6⅛ x 4 inches. New York: John Wiley & Sons. 1907. $0.75.

The book consists of tables showing area and population for all or most of the civilized countries of the earth, the population being classified by race, language, sex, birthplace, literacy, school attendance, conjugal condition, and religion; population of large cities; rates of increase of population; vital statistics; illegitimate births; defectives; breadwinners; financial statistics, and railway mileage and shipping; the mineral productions, including all metals and minerals of importance; agricultural products and consumption; livestock and fisheries; manufacturing products and consumption; wooded and cultivated areas; foreign commerce by countries and by commodities.

Camping and Tramping with Roosevelt. By John Burroughs. Pp. 111. 7⅝ x 5 inches. Illustrated. New York: Houghton, Mifflin & Co. 1907.

Handbook of American Indians. North of Mexico. Edited by Frederick Webb Hodge. Pp. 972. 9½ x 6 inches. Illustrated. Map. Washington: Government Printing Office. 1907. In two parts. Part 1.

A cyclopedia of the North American Indian. Descriptions of every tribe, of their myths, dances, and customs are given, as well as biographies of noted Indian characters.

Albanian and Bulgarian Captives in Macedonia
From "The Balkan Trail." Macmillan Co.

The Indian's Book. An offering by the American Indians of Indian Lore, Musical and Narrative, to form a record of the songs and legends of their race. Recorded and edited by Natalie Curtis. Pp. 573. 10⅛ x 7¼ inches. Illustrated. New York: Harper & Bros. 1907.

The American Indian. As a product of environment, with special reference to the Pueblos. By A. J. Flynn, Ph. D. Pp. 275. 5¼ x 8 inches. Illustrated. Boston: Little, Brown & Co. 1907.

Handbook of the Trees. Northern States and Canada. By Romeyn Beck Hough, B. A. Pp. 470. 9¾ x 7¼ inches. Illustrated. Published by the author. Lowville, N. Y. 1907. $8.00.

Mr Hough gives photographic illustrations of the fresh leaves, fruits, leafless branchlets and typical bark of every American tree east of the Rocky Mountains, with a map showing its geographic distribution. With this book as a guide any person can identify any tree east of the Rockies in winter, spring, summer or autumn. Years were required to obtain this photo-descriptive record, owing to the many difficulties met.

"Chief among these were the 'off' years, during which a species does not bear fruit. For example: One season I could not find a single tree of the common sugar maple bearing fruit, though I examined many from northern New York to North Carolina and westward to Missouri. One winter not a solitary twig could I find of the Yellow Birch bearing its dormant catkins, and, naturally, not a tree bearing flowers or fruit the next summer. I searched in vain two successive seasons for the pistillate flowers of the common butternut, so regularly did the late frosts of spring destroy them, though the staminate flowers appeared annually.

"The shortness of the period, too, during which the flowers or fruits of certain trees are in their prime, or even exist on the trees, has necessitated close watch. The exact time must be ascertained by observation, and if, perchance, I miss it I must wait until another year for another opportunity. Then I may find it an

Dogs Occupy the Pavement, People Walk in the Streets
Scene in Constantinople. From "The Balkan Trail." Macmillan Co.

off year (imagine my disappointment!), and still another year must be waited. Procuring specimens from lofty tree-tops are trivial ordeals compared with instances like these. Add to these vicissitudes the distribution of our trees, and the consequent necessity of being in many places at about the same time, and it can be readily understood that the field work required many seasons."

Afield With the Seasons. By James Buckham. Pp. 174. 7⅝ x 5⅛ inches. Illustrated. New York: Thomas Y. Crowell & Co. 1907. $1.25.

The Mountain People of Kentucky. An account of present conditions with the attitude of the people towards improvement. By William H. Haney. Pp. 196. 8¼ x 5½ inches. Illustrated. Cincinnati, Ohio: The Robert H. Clarke Co. 1906.

Mr Haney refutes the prevalent idea that these mountaineers are ignorant and sodden, maintaining that with opportunity they become eager to improve their condition.

The Future in America. A search after realities. By H. G. Wells. Pp. 259. 8⅜ x 5½ inches. Illustrated. New York: Harper & Bros. 1906.

The Wonder Book of Volcanoes and Earthquakes. By Prof. Edwin J. Houston. Pp. 369. 7½ x 5¼ inches. Illustrated. New York: Frederick A. Stokes & Co. 1907.

American Birds. Studied and photographed from life. By William Lovell Finley. Pp. 256. 8¼ x 5¾ inches. Illustrated. New York: Charles Scribner's Sons. 1907.

Representative birds from the humming bird to the eagle are described. Mr Finley carried both camera and notebook, and has succeeded in his purpose, to portray the bird as a live creature, showing its real wild personality and character.

Mars and Its Canals. By Percival Lowell. Pp. 393. 9 x 6 inches. Illustrated. New York: Macmillan Co. 1907. $2.50.

Earthquakes. An introduction to Seismic Geology. By William H. Hobbs. Pp. 336. 7⅞ x 5¼ inches. Illustrated. New York: D. Appleton & Co. 1907.

The Soil. Its nature, relations, and fundamental principles of management. By F. H. King. Pp. 303. 7¾ x 5¼ inches. Illustrated. New York: Macmillan Co. 1907.

The amateur and professional farmer will find this volume of much assistance.

The Turkish Barbershop

From "The Balkan Trail." Macmillan Co.

Modern Lithology. Illustrated and defined. For the use of university, technical and civil-service students. By Ernest Howard Adye. Pp. 128. 7½ x 5 inches. Illustrated. Edinburgh and London: W. & A. K. Johnston. 1907.

The Negro Races. A sociological study. Vol. 1. The Negrites. The Nigritians. The Fellatahs. By Jerome Dowd. Pp. 493. 8¾ x 6 inches. New York: Macmillan Co. 1907.

The Pearl. Its story, its charm and its value. By W. R. Cattelle. Pp. 376. 8 x 5½ inches. Illustrated. Philadelphia: J. B. Lippincott & Co. 1907. $2.00 *net.*

Mathematical Geography. By Willis E. Johnson. Pp. 336. 7½ x 5¼ inches. Illustrated. New York: American Book Co. 1907. $1.00.

Larger Types of American Geography. By Charles A. McMurry, Ph. D. Pp. 271. 7½ x 5½ inches. Illustrated. New York: The Macmillan Co. 1907. $0.75 *net.*

The types selected by Mr McMurry are: The Appalachian Mountains; the Rocky Mountains; the Pennsylvania Railroad; the first Pacific Railroad; the Mississippi River; the iron and steel business; cotton mills and cotton manufacture; New York City.

Natural Introductory Geography. By Jacques Redway and Russell Hinman. Pp. 146. 10¼ x 8¼ inches. Illustrated. New York: The American Book Co.

Natural School Geography. By Jacques Redway and Russell Hinman. Pp. 172. 12½ x 10 inches. Illustrated. New York: The American Book Co.

Library of Travel. An attractive, classical library of travel in six volumes. New York: Houghton, Mifflin & Co.

The titles are: "Our Old Home," Nathaniel Hawthorne; "The American in Holland," William Elliott Griffis; "A Little Tour in France," Henry James, Jr.; "Castilian Days," John Hay; "Italian Journeys," William Dean Howells; "In the Levant," Charles Dudley Warner. Each volume is printed in large type and contains a number of illustrations. These works will probably continue for many years the standard description of these countries.

Scenes from Every Land. A collection of 250 illustrations from the NATIONAL GEOGRAPHIC MAGAZINE. Edited by Gilbert H. Grosvenor. Pp. 225. 7 x 10 inches. With map and bibliography. Washington: National Geographic Society. 1907. $1.00.

The Springfield *Republican* says: "A highly instructive book of pictures published by the National Geographic Society at Washington is 'Scenes from Every Land,' a collection of 250 illustrations from the NATIONAL GEOGRAPHIC MAGAZINE, picturing the people, natural phenomena and animal life in all parts of the world. The editor does not claim for his little book any great mission, but he reminds us in his preface that "Geography also has its lighter side. The returned traveler always finds at

Dancing Girls in Borneo

From "Every Day Life Among the Head-hunters," by Dorothy Cator

home an audience appreciative of his tale of strange sights in foreign lands." And these pictures, taken from good photographs and published in a substantial, inexpensive form, should serve the purpose of interesting a great many people in one phase or another that had escaped notice. It is not too fine or costly to put into the hands of children, and should be of real value in arousing a liking for geography. It might well for this reason find a place in school libraries. All these pictures have been published to illustrate articles in the NATIONAL GEOGRAPHIC MAGAZINE, and the bound volumes can be found in any good public library for reference by those whose curiosity is aroused, and the books whose titles are quoted will be found helpful in study."

Home Life in All Lands. By Charles Morris. Pp. 316. 7½ x ¼ inches. Illustrated. Philadelphia: J. B. Lippincott Co. 1907.

The Land in the Mountains. Being an account of the past and present of Tyrol. By W. A. Baillie-Grohman. With an introduction by Charles Landis. Pp. 288. 9 x 6 inches. Illustrated. Philadelphia: J. B. Lippincott Co. 1907. $5.00.

Under the Syrian Sun. The Lebanon, Baalbek, Galilee, and Judæa. By A. C. Inchbold. Pp. 262. 9¼ x 6½ inches. Illustrated. 2 vols. Philadelphia: J. B. Lippincott & Co. 1907. $6.00 *net.*

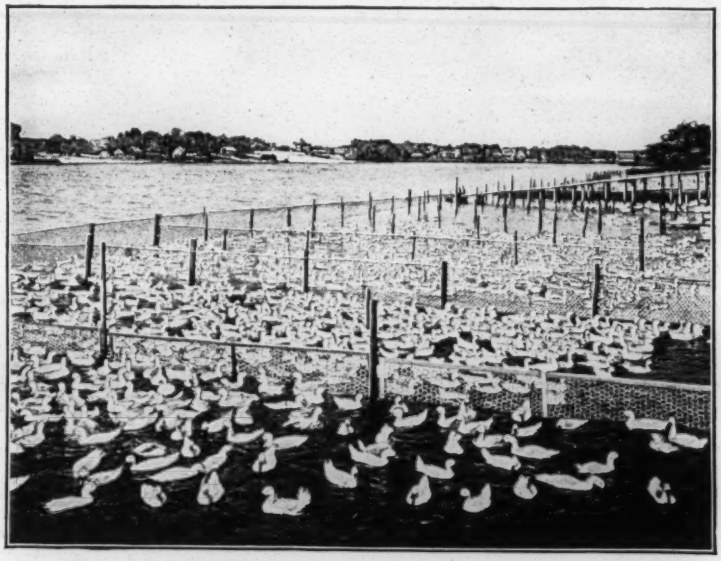
Syria, the Desert and the Sown. By Gertrude Lowthian Bell. Pp. 347. 8¾ x 5½ inches. Illustrated. E. P. Dutton & Co. 1907. $3.00 *net.*

Nigeria, Our Latest Protectorate. By Charles H. Robinson. 9 x 6 inches. Illustrated. London: Horace Marshall & Son.

The Pulse of Asia. A journey in Central Asia illustrating the geographic basis of history. By Ellsworth Huntington. Pp. 415. 8¾ x 6 inches. Illustrated. New York: Houghton, Mifflin & Co. 1907. $3.50.

Physiography. By Rollin D. Salisbury, Head of the Department of Geography, University of Chicago. Henry Holt & Co. 1907. 8vo. $3.50.

This volume, uniform in size and binding with the Textbook of Geology by Chamberlin



A Duck Farm in the United States

From "How the World is Fed," by Frank G. Carpenter. Copyright by Mr Carpenter

and Salisbury, is by far the most comprehensive book on this subject which has been published in this country. Its 770 pages evince the importance which physiography has assumed among the geologic sciences. The scope of the book may be gained from the chapter titles, which are as follows: Relief Features, The Work of the Atmosphere, The Work of Ground Water, The Work of Running Water, The Work of Snow and Ice, Lakes and Shores, Vulcanism, Crustal Movements, Origin and History of Physiographic Features, Terrestrial Magnetism, Earth Relations, General Conception of the Atmosphere, Constitution of the Atmosphere, Temperature of the Air, The Moisture of the Air, Atmospheric Pressure, General Circulation of the Atmosphere, Weather Maps, Climate, General Conceptions of the Ocean, Composition of Sea Water, The Temperature of the Sea, The Movements of Sea-water, The Life of the Sea, Materials of the Sea Bottom, Relations of the Sea to the Rest of the Earth.

The book is intended primarily for the use of college students, with whose needs its author is eminently familiar. The text statements are unusually clear and precise and the 707 diagrams and half-tone illustrations are especially well selected. Besides these, there are 26 plates reproducing portions of topographic sheets of the U. S. Geological Survey.

Features deserving especial commendation are the unusual amount of attention devoted to the larger relief features of the earth's surface, the clearness with which the motions and astronomic relations of the earth are set forth, and the directions for topographic map studies at the close of many of the chapters.

EDSON S. BASTIN,
U. S. Geological Survey.

A Trip to the Orient. By Robert Ulric Johnson. Pp. 392. 5¾ by 8 inches. Illustrated. Philadelphia: John C. Winston Co. 1907.

Mr Jacob gives a very entertaining story of a Mediterranean cruise, his chapters about Constantinople being particularly good. A valuable feature of the book is the large number of illustrations from photographs, there being nearly 200 views in Funchal, Granada, Algiers, Malta, Athens, Constantinople, Cairo, Jerusalem, Luxor, Naples, and Nice.

LOWEST POINT IN THE UNITED STATES

THE United States Geological Survey has just completed a line of spirit levels through Death Valley, California, and, much to the surprise of every one familiar with the region, has ascertained that the depth of that area is not so great as was supposed. The final computations of the results have not yet been made, but the preliminary figures give

for the lowest point a depth of 276 feet below sea-level. Bennetts Well, which is near this point, is 266 feet below sea-level. These figures may be altered by two or three feet when the final computations are made, but they are probably not more than three feet in error. The Geological Survey now has elevation marks on the highest and lowest points on dry land in the United States.

It is a strange coincidence that these two extremes are both in southern California and only 75 miles apart. Mount Whitney is a foot or two over 14,500 feet above sea-level, while Death Valley, as above stated, is 276 feet below. Before the Salton Sink, also in southern California, was flooded by the Colorado River, it contained the lowest point of dry land in the United States, a spot 287 feet below sea-level.

Previous estimates of the depth of Death Valley based on barometer readings gave for the lowest point figures varying from 250 to 450 feet below sea-level. The level line of the Geological Survey is believed to be the first accurate determination of elevations in that locality that has ever been made.

IMAGINATION AND GEOGRAPHY

THE following editorial from the Boston *Herald* of November 23 is reprinted here, as it is believed those members of the National Geographic Society who have not seen the article will be interested to read this appreciation of the work of the organization:

The National Geographic Society of Washington, D. C., is doing a work, through the monthly publication of its magazine, which no intelligent man or woman can afford to remain ignorant of. Geography by itself is ordinarily thought a dry subject. Geography, on the contrary, based on geology or the vivid presentation of the great physical features of the earth on which depend all civilizations, customs, avocations, sciences, and literatures, easily becomes one of the most fascinating of studies, or even of mere cursory skits of reading.

Strange to add, in its bearing on such affections of the heart as ardent love of country and patriotic pride in its great foreordained destinies, here is an agency the force of which cannot be overstated. Indeed, the modern innovation of hatching chickens by incubators instead of hens is simply nowhere compared with the system of hatching patriots of the stamp of William Tell by geological geography, as exemplified in the faith and works of the National Geographic Society of Washington, D. C.

This is no wild paradox. In truth, have not the gravest historians insisted that the reason why there is no such thing as the existence of patriotic sentiment in China is solely due to the fact that the human heart is incapable of loving 400,000,000 fellow-creatures one knows nothing about. They are a pure numerical abstraction to a man. Of their lives, languages, aspirations, joys, and sorrows he is ignorant of every concrete item, unless that they all wear the national pigtail; and so, even this dangling appendage is not potent enough to bind the people together in the chords of universal love.

Just the same used to be asserted of the United States of America. The States were too big, too broadly dispersed, too divergent in interests, for any one to be capable of loving their multitudinous populations as fellow-countrymen. All this, however, at any rate in the eyes of the National Geographic Society of Washington, is now rapidly being done away with. It is getting effected through a vivid appeal to the visual imagination which is enabling us all to see, in the mind's eye, our whole country at once and as a whole. The stupendous national enterprises already completed, or about to be inaugurated, are fast annihilating all lines of geographical division, and enlisting the minds and hearts of the scattered millions in vast undertakings in which all share a common interest and common pride.

Let any one, for example, read the National Geographic Society's article on "The Deep-water Route from Chicago to the Gulf." Here is a project simply continental in scale, especially when taken in connection with the immense water routes already existing by way of the Great Lakes, from the head of Superior to Chicago itself. What does the vast scheme imply? A 14-foot channel all the way to the Gulf of Mexico. And what is meant by the Mississippi River? Not a single stream, but the stream and all its thousands of miles of immense tributaries, the Missouri, Ohio, Tennessee, Illinois, Arkansas, Red, and countless other rivers.

The mind is fairly staggered in the attempt to take in the millions of square miles of the richest lands in the world this would open up. And, best of all, the interests of the North, South, East, and West would be indivisibly subserved by it. No more talk of congestions of freight, when every powerful towboat could tow from thirty to forty railway train loads. The local is merged in the universal. It is no more New Orleans' special route than Duluth's special route. And it is in this way—by a vivid appeal to visual imagination—that the National Geographic Society essays to enable us to focus the whole country on each one's individual eyeball, and so to abolish China.

PROPOSED CHANGE IN THE BY-LAWS OF THE NATIONAL GEOGRAPHIC SOCIETY

THE Board of Managers of the Society recommend the adoption of the following By-laws at the annual meeting of the Society on January 10, 1908. For the information of the members the present By-laws are printed after the proposed new By-laws.

ARTICLE I.—*Name.*

The name of the Society is "THE NATIONAL GEOGRAPHIC SOCIETY."

ARTICLE II.—*Object.*

The object of the Society is the increase and diffusion of geographic knowledge.

ARTICLE III.—*Membership.*

SECTION 1. The Society shall consist of members, honorary members, fellows, and patrons.

SEC. 2. Members shall be persons interested in the increase and diffusion of geographic knowledge.

SEC. 3. Honorary members shall be persons who have attained eminence by the promotion of geographic science. They shall not be members of the corporation, nor shall they vote or hold office.

SEC. 4. Fellows shall be persons engaged in scientific work pertaining to geography. They shall be members of the corporation.

SEC. 5. Patrons shall be persons interested in geography who have contributed one thousand dollars ($1,000) or more to the objects of the Society; they shall be entitled to all the privileges of membership for life.

SEC. 6. The election of members, honorary members, fellows, and patrons shall be entrusted to the Board of Managers.

ARTICLE IV.—*Officers.*

SECTION 1. The administration of the affairs of the Society shall be intrusted to a Board of Managers composed of not more than 24 members, eight of whom shall be elected by the Society at each annual meeting to serve for three years or until their successors are elected. A majority of the votes cast shall be necessary for election.

SEC. 2. The officers of the Society shall be a President, a Vice-President, a Secretary, and a Treasurer, who shall be elected annually by the Board of Managers from its own number. The Board shall also elect an Editor, who shall have general charge of the work of the office, subject to the direction of the Executive Committee; an Assistant Treasurer, and an Assistant Secretary.

SEC. 3. The President shall preside at the meetings of the Society and of the Board of Managers, or in the absence of the Vice-President, may delegate this duty to some other member of the Board.

SEC. 4. In the absence of the President, his duties shall devolve upon the Vice-President.

SEC. 5. The President and Secretary shall sign all written contracts and obligations of the Society.

SEC. 6. The Treasurer shall have charge of the funds of the Society under the direction of the Board of Managers, and shall make collections and disbursements and render a semi-annual report and such special reports as may be called for by the Board; and his accounts shall be audited by a Committee semi-annually, and at such other times as the Board may direct.

SEC. 7. The Secretary shall record the proceedings of the Society and of the Board of Managers, conduct correspondence, and submit an annual report to the Board, and to the Society at its annual meeting.

SEC. 8. The Board of Managers shall fill vacancies arising in the Board and among the officers.

SEC. 9. The Editor shall, under the direction of the Executive Committee, have charge of the general business of the Society in accordance with the By-Laws and with such instructions as may, from time to time, be given by the Board of Managers. All employees of the Society shall perform their duties under his personal supervision.

SEC. 10. The Assistant Treasurer shall, under the direction of the Treasurer, perform such duties in connection with the disbursement of the funds of the Society and the preparation of vouchers, abstracts and reports as the Treasurer may direct.

SEC. 11. The Assistant Secretary shall perform such duties as the Secretary may delegate to him and shall also assist the Editor in the general management of the affairs of the office. In the absence of the Editor, he shall have general charge of the office work.

ARTICLE V.—*Committees.*

SECTION 1. There shall be an Executive Committee consisting of the President, Vice-President, Secretary and Treasurer, and three others to be elected annually by the Board of Managers from its own members.

SEC. 2. As soon as practicable after the annual meeting, the President shall appoint the following Standing Committees, the members of which shall serve until their successors are designated.

1. Committee on Rules.
2. Auditing Committee.
3. Committee on Finance.
4. Committee on Membership.
5. Committee on Research.
6. Committee on Publications and Lectures.

The President shall be *ex officio* a member of each Standing Committee, and shall be Chairman of the Executive Committee.

ARTICLE VI.—*Duties of Committees.*

1. Executive Committee.

The Executive Committee shall, during the intervals between the meetings of the Board of Managers, possess and exercise all of its powers and functions, except as to matters consideration of which may be prohibited by said Board; provided that full reports of all such proceedings shall be made to the next succeeding regular meeting of the Board.

2. Committee on Rules.

The Committee on Rules shall consist of the President of the Board of Managers and three other members, to whom shall be referred all motions to alter or modify the By-Laws, and who shall report thereon at the next meeting of the Board.

3. Auditing Committee.

The Auditing Committee shall consist of three members of the Society, not more than one of whom shall be a member of the Board of Managers. It shall examine the semi-annual reports of the Treasurer with the vouchers for expenditures, and report thereon at the next regular meeting of the Board of Managers.

4. Finance Committee.

The Finance Committee shall consist of three members of the Board of Managers. It shall act as an advisory committee to the Board of Managers in all financial matters.

5. Committee on Membership.

The Committee on Membership shall consist of three members, whose duty shall be to inquire as to the eligibility of all applicants for membership whose names may be referred to it, and to report thereon to the Board of Managers for its final action.

6. Committee on Research.

The Committee on Research shall be charged with the consideration of all matters of scientific and technical geography, including exploration, which may be brought before the Society, or which may originate in the Committee; and shall report thereon to the Board of Managers, with recommendations for action. Subject to the approval of the Board of Managers, it may form a technical section within the Society, which is authorized to use for its meetings and discussions the hall of the Hubbard Memorial Building.

7. Committee on Publications and Lectures.

The Committee on Publications and Lectures shall consist of the President, the Editor, and the Secretary, to which Committee shall be referred for approval all proposed publications of the Society other than the Magazine. This committee will also make arrangements for all lectures under the auspices of the Society.

ARTICLE VII.—*Finances.*

SECTION 1. The fiscal year of the Society shall begin on the first day of January.

SEC. 2. The annual dues of members shall be $2.00, payable in January.

SEC. 3. Fellows shall pay an initiation fee of $10.00 on notice of election.

SEC. 4. Members or fellows, on approval of the Board of Managers, may commute annual dues and acquire life membership by the payment at one time of $50.00. Life members shall be entitled to two admissions to each lecture and course.

SEC. 5. Members or fellows whose dues remain unpaid on March 1 shall be notified by the Treasurer that unless dues are paid within one month they will be in arrears and not entitled to receive the publications of the Society or to purchase tickets on members' terms. Members or fellows one year in arrears may, after formal notification, be dropped from the rolls of the Society. Objectionable members may be dropped by a two-thirds vote of the Board of Managers at any regular meeting.

ARTICLE VIII.—*Expenditures.*

There shall be prepared annually by the Editor under the direction of the Finance Committee, about October 1st, a statement showing the probable income and the probable expenditures for the ensuing year. The Board of Managers will then determine the amount of available funds to be applied to each of the activities of the Society, naming in each case the maximum amount that may be expended. It shall be the duty of the Treasurer to report to the Board whenever there appears to be a probability that the income will not be sufficient to meet the several allotments.

ARTICLE IX.—*Publications.*

The Society shall publish a journal or periodical under the title, "THE NATIONAL GEOGRAPHIC MAGAZINE," which shall be sent to all classes of members of the Society, not in arrears, and may be placed on sale. The Society may also publish such special books, monographs and reports as the Board of Man-

agers may authorize. The special publications shall not be a prerogative of membership.

ARTICLE X.—*Medals.*

The Society, by vote of the Board of Managers, may award medals for distinguished accomplishment in geography.

ARTICLE XI.—*Meetings.*

SECTION 1. The annual meeting of the Society shall be held in the District of Columbia on the second Friday in January. Twenty members or fellows shall constitute a quorum.

SEC. 2. Special meetings may be ordered by the Board of Managers or called by the President.

SEC. 3. Regular meetings of the Board of Managers shall be held on the third Wednesday in October, December, January, April, and June; special meetings may be held at the call of the President or on notice signed by five members of the Board. Seven members shall constitute a legal quorum of the Board.

SEC. 4. Lectures and lecture courses may be provided by the Board of Managers. Free admission to such lectures shall not be a prerogative of membership, except as otherwise provided in these By-Laws, but tickets shall be sold to members and fellows on more favorable terms than to non-members.

SEC. 5. Cushing's Manual shall be the parliamentary guide and govern the proceedings of the National Geographic Society and the Board of Managers when not in conflict with the specific provisions of these By-Laws.

ARTICLE XII.—*Amendments.*

These By-Laws may be amended by a two-thirds vote of the members of the Society present at any meeting, provided the proposed amendments are reported by the Board of Managers, and provided that notice thereof has been sent to all members of the Society not less than 10 days before the meeting. The publication of the proposed amendments in THE NATIONAL GEOGRAPHIC MAGAZINE shall be sufficient notice within the meaning of this article.

PRESENT BY-LAWS OF THE NATIONAL GEOGRAPHIC SOCIETY

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* No fellows have as yet been elected.

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SEC. 2. The Board of Managers shall elect annually from their own number a President and a Vice-President, and shall elect annually a Treasurer and a Secretary.

SEC. 3. The President shall preside at the meetings of the Society and of the Board of Managers, or may delegate this duty. The President and the Secretary shall sign all written contracts and obligations of the Society.

SEC. 4. In the absence of the President his duties shall devolve on the Vice-President.

SEC. 5. The Treasurer shall have charge of the funds of the Society, under the direction of the Board of Managers, and shall make collections and disbursements and render an annual report, and his accounts shall be audited by a committee of the Society, not members of the Board, annually and at such other times as the Board may direct.

SEC. 6. The Secretary shall record the proceedings of the Society and of the Board of Managers, conduct correspondence, and make an annual report.

SEC. 7. The Board of Managers shall fill vacancies arising in the Board.

SEC. 8. All officers shall serve until their successors are chosen.

ARTICLE V.—*Committees.*

SECTION 1. The Board of Managers shall select annually from its own number an Executive Committee.

SEC. 2. There shall be standing committees on Publications, Communications, Admissions, Research, and Finance, whose chairmen shall be members of the Board of Managers. These

committees shall be appointed immediately after the annual election of the President, to serve until their successors are designated.

SEC. 3. The committees of the Society and of the Board of Managers shall be appointed by the President except when otherwise provided. The President shall be a member *ex officio* of every committee.

ARTICLE VI.—*Finances.*

SECTION 1. The fiscal year of the Society shall begin on the first day of January.

SEC. 2. The annual dues of members shall be two dollars, payable in January.

SEC. 3. Fellows shall pay an initiation fee of ten dollars on notice of election.

SEC. 4. Members or fellows may commute annual dues and acquire life membership by the payment at one time of fifty dollars.

SEC. 5. Members or fellows whose dues remain unpaid on March 1 shall be notified by the Treasurer that unless the dues are paid within one month they will be in arrears and not entitled to vote at the annual meeting, to receive the publications of the Society, or to purchase lecture tickets on members' terms. Members or fellows one year in arrears shall, after formal notification, be regarded as having withdrawn from the Society.

SEC. 6. The funds of the Society may be invested and loans may be negotiated in the interests of the Society, and any other financial business germane to the purposes of the Society may be transacted, by the Board of Managers.

ARTICLE VII.—*Meetings.*

SECTION 1. Regular meetings of the Society shall be held on alternate Fridays from November until May.

SEC. 2. Special meetings may be ordered by the Board of Managers or called by the President.

SEC. 3. The annual meeting shall be held in the District of Columbia on the second Friday in January.

SEC. 4. Twenty members or fellows shall constitute a quorum.

SEC. 5. Regular meetings of the Board of Managers shall be held on the same days as the regular meetings of the Society; special meetings may be held at the call of the President or on notice signed by five members of the Board: *Provided*, That for any of its own meetings the Board may substitute meetings of the Executive Committee.

SEC. 6. Lectures and lecture courses may be provided by the Board of Managers. Free admission to such lectures shall not be a prerogative of membership, but tickets shall be sold to members and fellows on more favorable terms than to non-members: *Provided*, That each life member who acquired life membership prior to the year 1901 shall be entitled to two admissions to each lecture and course.

ARTICLE VIII.—*Publications.*

The Society shall publish a journal or periodical under the title, *The National Geographic Magazine*, which shall be sent to all members and fellows of the Society not in arrears, and may be placed on sale.

ARTICLE IX.—*Amendments.*

These By-Laws may be amended by a two-third vote of the members present at any regular meeting, provided the proposed amendments are reported by the Board of Managers, and provided that notice thereof has been sent to all members of the Society not less than ten nor more than sixty days before the meeting. The publication of proposed amendments in The National Geographic Magazine shall be deemed a notice within the meaning of this article.

THE NATIONAL GEOGRAPHIC SOCIETY

Friday, December 13, 1907—"The Land of the Incas." Mrs Harriet Chalmers Adams, author of "The City that was Exchanged for New York," "East Indians in the New World," in the NATIONAL GEOGRAPHIC MAGAZINE for June and July, 1907. Illustrated.

December 14, 1907—Annual Banquet. The New Willard.

Friday, December 20, 1907—"The Second Peace Conference at The Hague." Hon. John W. Foster, formerly Secretary of State.

Friday, January 3, 1908—"The Geography of Mars." Percival Lowell, LL.D., Director of the Lowell Observatory, of Flagstaff, Arizona.

Friday, January 10, 1908—Annual Meeting, Reports and Elections. "Two Thousand Miles on Muleback through the Andean Wonderland." Hon. John Barrett, Director of the International Bureau of American Republics. Illustrated.

Friday, January 17, 1908—"A Camel Trip in the Salt and Sand of Chinese Turkestan." Mr Ellsworth Huntington, of Yale University, author of "The Pulse of Asia." Illustrated.

Friday, January 24, 1908—"The Pelicans of America: An Account of Field Studies of the White Pelican in the Western States and in Northwest Canada, and of the Brown Pelican in Florida." Mr Frank M. Chapman, of the American Museum of Natural History. Illustrated.

Friday, January 31, 1908—"The Conservation of Our Natural Resources." Mr Gifford Pinchot, Chief of the U. S. Forest Service.

Friday, February 7, 1908—"South Africa: The Natives and the Mines." Mr Gardiner F. Williams, author of "The Diamond Mines of South Africa" and for many years General Manager of the De Beers Diamond Mines, Kimberley. Illustrated.

Friday, February 14, 1908—"The Deep-water Route from Chicago to the Gulf and its Connections." Hon. Joseph E. Ransdell, Member of Congress from Louisiana and President of the Rivers and Harbors Congress.

Friday, February 21, 1908—Hon. George Shiras, 3rd, of Pittsburg, has accepted the invitation of the National Geographic Society to address the Society on some of his experiences in hunting wild game with the camera. Illustrated.

Friday, February 28, 1908—"Holland's War with the Sea." Prof. J. Howard Gore. Illustrated.

Friday, March 6, 1908—"The Missions of California." Hon. Joseph R. Knowland, Member of Congress from California.

Friday, March 13, 1908—"Arizona—The Egypt of the New World." Mr Frederick Monsen. Mr Monsen describes not only the ancient ruins, but the country as it is today, with its Indian tribes, Spanish-Mexican settlements, and American towns. The wonderful Snake Dance of the Hopis will be shown.

Friday, March 20, 1908—"Persia—Past and Present." Dr A. V. Williams-Jackson, of Columbia University. Illustrated with unusual pictures taken by Professor Jackson on extensive journeys through the ancient kingdom.

Friday, March 27, 1908—"The Geography of the Sea." Rear Admiral Colby M. Chester, U. S. Navy.

Friday, April 3, 1908—"Cathedrals, Mosques, and Temples of the World." Hon. O. P. Austin, Chief U. S. Bureau of Statistics. Illustrated.

LAKE CAHUILLA

The Ancient Lake of the Colorado Desert

AT a recent meeting of the Cosmos Club of Tucson, the following communication was read by Mr William P. Blake, emeritus professor of geology, University of Arizona.

The ancient sheet of water which in comparatively recent geologic time filled the basin of the Colorado Desert, below the sea-level, and left the records of its occupation of the valley by deposits of travertin upon its rocky shores, by lines of deserted beaches, by deposits of lacustrine clays holding myriads of fossil fresh-water shells, and all below the level of the Gulf of California, were for the first time recognized and described by me, in the year 1853, in a San Francisco newspaper edited by J. D. Whelpley, and afterwards in the Report of Geological Reconnaissance in California, 1854-5, and in volume v of United States Explorations and Surveys from the Mississippi River to the Pacific Ocean.

The outline of the lake—its length, breadth, and depth—its relations to the Colorado River and the Gulf, its origin and history, were described at that time, and these descriptions and this theory of origin have since been confirmed and sustained by later explorations.

Public attention has of late been directed toward the region by reason of its partial submergence and the destruction of the salt beds at Salton, in the lowest part of the valley. This new sheet of water, which does not rise to the ancient lake-level, is known as the "Salton Sea" and is appropriately named; but this name should not apply to the ancient lake in its entirety, which requires a distinctive designation, just as, for example, the ancient sheet of water of which the great Salt Lake is a residue is known as Lake Bonneville.

As the original discoverer and describer of the ancient lake, I suggest the propriety of giving it a name, and propose "Lake Cahuilla," Cahuilla being the tribal name of the aborigines who were found living in and about the valley now very generally known as the Cahuilla Valley and whose descendants are still there.

INDEX TO VOLUME XVIII

Page

Abruzzi, Duke of, referred to..... 50, 73
Adams, Harriet Chalmers; East Indians in the New World 485
—; Picturesque Paramaribo 365
Aerial locomotion, Bibliography of..... 28
Aero Club of America, Resolutions by, recognizing Professor Langley's work..... 7
Aerodrome, Notes on construction of; Alexander Graham Bell 8
"Aerodynamics, Experiments in," Book quoted.. 3
Africa; Hunting big game in East Africa..... 723
—, Scenes from North Africa..... 615
Alaska, Coal-bearing rocks of..... 169
—, Harbors of..... 177
—, Mineral resources of..... 167, 171
—, Railway routes in..... 165
—, Reindeer in..... 686
Amundsen, Roald, Elected to honorary membership in the National Geographic Society..... 51
—, Gold medal awarded to..... 746
American Alpine Club, Publication by..... 213
Andes 82
Andree's fatal attempt..... 457
Antarctics, An ice-wrapped continent..... 95
—, Discoveries of the Antarctic Continent..... 113
—, Motor sledges in the..... 214
Archæology in the air..... 151
Arctics, Andree's fatal attempt in the..... 457
—, Greely's Handbook of discoveries in the..... 451
—, Expeditions commanded by Americans to the. 458
—; Map of North Polar regions..... 454
—; Nearest the Pole; Robert E. Peary..... 446
—, Peary's twenty years' service in the..... 451
—; Polar photography; Anthony Fiala..... 140
—, Seventy-five days' in the; Max Fleischmann. 439
—, Ziegler Expedition to the, Narrative of..... 72
—, Ziegler expeditions referred to..... 468
Austin, O. P.; Queer methods of travel in curious corners of the world..... 687
—, Statistical abstract of..... 420, 424
Avery, W. L., cited..... 277
Bailey, Vernon, Report on wolves by..... 145
Bainbridge, Oliver; The Chinese Jews..... 621
Baird, Professor, cited..... 397
Balch, Edwin S., cited on Antarctics..... 114
Baldwin, E. B., Arctic expedition referred to.... 468
Balloons 1
Barclay, President, referred to..... 339
Barrille, Edward, referred to..... 54
Bauer, L. A.; The work in the Pacific Ocean of the magnetic survey yacht "Galilee"..... 601
Beebe, W. M., Expedition referred to..... 468
Bell, Alexander Graham, Address by..... 53
—, Aerial boats of..... 671
—; Aerial locomotion 1
—, Early experiments of..... 8
—, referred to..... 281
—, Tetrahedral tower of..... 672
Bell, Charles J., referred to..... 281
Bell, Robert, Arctic expedition referred to..... 468
Benares, Burning and bathing ghats of..... 118
Berbers, The 615
Bernier, J. E., Arctic expedition referred to..... 468
Berry, Robert M., Arctic expedition referred to.. 459
Bighorn Mountains; N. H. Darton..... 355
Birds, True models of flight of..... 1
Blackwelder, Eliot, referred to..... 640
Blaine, James G., Address of, cited..... 64
Blanchard, C. J.; Millions for moisture..... 217
Blodgett, C. J., referred to..... 412
Boats driven by aerial propellers..... 21
Bolivia, A country without a debt; Y. Calderon.. 573
—, Commerce of 579
—, Geography of..... 578
—, Railroads in, to be built with American capital 580
Bonaparte, Charles J., Address by..... 51
Bowers, George M.; Planting fishes in the ocean.. 715
Brooks, Alfred H.; Railway routes in Alaska.... 165
Broward, Governor, referred to..... 298
Brown, W. L., referred to..... 742
Browne, Belmore H., referred to..... 54
Bridges of Utah, The great natural..... 199

Page

Bridgman, Herbert L., Photographs sent to library of National Geographic Society by..... 744
—, referred to (expedition)..... 468
British Columbia, Hunting the grizzly in..... 612
Brown, Robert Marshall; A simple method of proving that the earth is round..... 771
Bryant, Henry, Drift cask planned by..... 454
—, Expendition referred to..... 468
Budapest, Saint Stephen's fete in..... 548
Bulgaria, Tirnova, city of the hanging gardens.. 632
Cabrera, Estrada, referred to..... 277
Calderon, Y.; Bolivia, a country without a debt.. 573
Campbell, Marius R.; How long will the coal reserves of the United States last..... 129
—, Table by, showing relative efficiency of coals. 139
Canada, Origin of the word..... 215
Canadian Rockies, Camp fires in the..... 215
Central America, Notes on..... 272
—, Table showing commerce of..... 278
Ceylon, Sigiri Rock of..... 151
—, Women and children of..... 249
Champ, W. S., Arctic expedition referred to.... 468
—, Plates of maps loaned National Geographic Society by 404
—, referred to..... 75
Chanute, Octave; Bibliography relating to aerial navigation 28
—, referred to..... 3
Chicago, Drainage canal built by..... 677
China, Geologists in..... 640
—, Jews of..... 621
—, Women and children of..... 268, 269
Clam, Soft-shelled 395
Cleveland, Grover, Forest reserves proclaimed by. 523
Climate, Influence of small bodies of water on.. 246
Climatology of the United States..... 147
Cloud Peak 356
Coal, Efforts to obtain greater energy from.... 138
— producing nations, Diagram showing their output 130
— reserves of the United States..... 129
Colorado Desert, Irrigation of..... 37
—, Wonders of the 147
Commerce and Labor, Department of, referred to 334
Cook, Frederick A., referred to..... 54, 452
Corey, H. T., referred to..... 44
Congo, Truth about the..... 811
Cornelius, S. A., Photograph of oil well..... 348
Cortelyou, Postmaster General, Report of, cited.. 70
Coville, F. V., referred to..... 281
Crab, Giant spider..... 280
Creak, Captain, cited..... 601
Cuba aided by the United States..... 429
Curtis, Edward S., Pictures of Indians by..... 469
Curtis, W. E., cited..... 277
—; The revolution in Russia..... 302
Darton, N. H.; Bighorn Mountains..... 355
—; Mexico, the treasure house of the world.... 493
Davis, A. P.; The new inland sea..... 37
Davis, Charles E. L. B.; On commerce in Sault Sainte Marie Canal..... 682
Davis, G. G., Expedition referred to..... 468
Davis, Theodore M., referred to..... 746, 801
Davis, W. M., referred to..... 428
Denby, Charles, referred to..... 281
Dewey, George, elected Honorary Member of National Geographic Society..... 51
"Discovery," Voyage of the..... 95
Dismal Swamp 301
Doubtful island region, A recent report from.... 205
Drainage of swamp lands..... 292
Drift cask 454
Dyar, W. W., referred to..... 199
Earth, Method of proving it is round..... 771
Earthquake, Echoes of the San Francisco..... 351
East, Women and children of the..... 248
Ecuador, Beautiful, Guayaquil..... 81
—, Ascending the Andes 82
—, Quito 87
Eichelberger, F. B., referred to..... 281
England, Heart of..... 147
Everglades, Florida 300

Page

Explorers who have reached farthest north..... 50
Fairchild, David, referred to..... 615
—; Madeira, on the way to Italy..... 751
Falls, De Witt Clinton; Saint Stephen's fete in Budapest..... 548
Farmers, Helping the..... 746, 781
Farthest north, Explorers who have reached..... 50
Farthest south, Explorers who have reached..... 99
Fay, Charles E., referred to..... 213, 746
Fiala, Anthony, Arctic expedition referred to.... 468
—; Book on fighting the polar ice..... 72
—, Plates of map loaned to National Geographic Society by..... 454
—, Polar photography by..... 140
Fisheries, Bureau of, Work of..... 385, 394
Fishery Bureau, Federal, referred to..... 391, 393
Fishes in the ocean, Planting..... 715
—, Extent of the work..... 721
—, Species of, cultivated..... 716
— that build nests and take care of their young. 400
Fish immigrants: Foreign fishes in the United States..... 395
—: Our objects of acclimatization..... 385
—: Some unwise introductions..... 386
—: U. S. fishes in our insular possessions..... 395
Fleischmann, Max; Seventy-five days in the Arctics..... 439
Fleischmann, Mrs. Max, referred to..... 440
Flying machines..... 1
Forest policy, Our national..... 523
Forestry of the Guianas..... 376
Forests, Capitalized value of the national..... 526
Forests, Saving the; Herbert M. Smith..... 519
—, Investigation of grazing range in the national 527
—, Most important product of..... 527
—, Table showing location, etc..... 528
Forest Service, Notes on the..... 142, 789
Gannett, Henry, Books reviewed by..... 147, 148
—, Elected member of the Council of Geographical Society of Paris..... 428
Gardens, City of the hanging..... 632
Garlington, E. A., Arctic expedition referred to.. 468
Geographers, Four prominent..... 425
Geographical Congress..... 491
Geographical Society of London, Royal, Expedition planned by..... 95
Geographical Society of Philadelphia referred to.. 454
Geographic Board, Decisions of United States... 216
Geographic literature.....72, 75, 78, 91, 95, 147, 148, 215, 354, 413, 451, 534, 559, 594, 723, 813
Geographic Society, National..... 746
—, Achievements of members of, referred to by President Moore..... 50
— banquet, December 15, 1906..... 49
— — members and guests present..... 58
—, Committees for 1907..... 216
—, Directed scientific work of Ziegler Polar Expedition..... 72
—, Expedition equipped by a member of..... 199
—, Honorary members of..... 51
—, Map of North Polar regions..... 454
—, Meetings of..... 78, 148, 746
—, Membership of..... 54
—, Presentation of Hubbard medal to Commander Peary by President Roosevelt on behalf of.... 49
—, referred to by Dr Alexander Graham Bell... 54
—, Remarks of President Moore on the..... 49
—, Representative on Polar expedition referred to 443
—, Representative of, on Wellman Expedition.. 458
—, Resolution adopted by..... 281
—, "Scenes from Every Land"..... 348
—, Scientific report referred to..... 72
—, Subscription to Peary Expedition by..... 281
Geological Survey, Canadian, referred to..... 209
Geological Survey, United States, Atlas sheets for teaching physiography by..... 353
—, Measurements of stream discharge made by.. 527
—, New topographic maps by..... 353
—, referred to..... 214
Gill, Theodore; Parental care among fresh-water fishes..... 400
Globe and Geographical History, International.... 281
Gore, J. Howard, Photographs presented to National Geographic Society by..... 744
Greely, A. W., Arctic expedition referred to.... 459
—, cited..... 113
—, Handbook of Arctic discoveries by..... 451

Page

Greely, A. W., honorary corresponding member of the Geographical Society of Paris..... 428
—, referred to..... 50, 455
Gregory, W. M., Ore-boat unloaders..... 343
Grinnell, George Bird, cited on pictures of North American Indians by E. S. Curtis..... 484
Grosvenor, Gilbert H.; An ice-wrapped continent 95
—; Bell's tetrahedral tower..... 672
—; Book reviews..72, 91, 209, 215, 354, 424, 811, 813
—; Deep-water route from Chicago to the Gulf.. 679
—; Geographic notes.....36, 49, 138, 145, 199, 209, 248, 281, 348, 353, 424, 425, 615, 620, 640, 886, 744, 795, 800, 801
—; Helping the farmers..... 746
—; Maoris of New Zealand..... 198
—; Map of the North Polar regions prepared by. 454
—; Motor sledges in the Antarctic..... 214
—; No Man's Land—Spitzbergen..... 455
—; North American Indians..... 469
—; Notes on Central America..... 272
—; Notes on the Forest Service..... 142
—; Our heralds of storm and flood..... 586
—, referred to..... 281
—; "Scenes from Every Land"..... 348, 744
—; Schilling's flashlights from the jungle..... 534
—; Some of our immigrants..... 317
Grosvenor, Mrs Gilbert H., Book reviews by.... 75
Guiana wilderness, The..... 373
Hague, James D., A recent report from the doubtful island region..... 205
Hale, Edward Everett, Invocation at banquet of the National Geographic Society by..... 49
Hargrave, Lawrence; Bibliography relating to aerial locomotion..... 33
Heilprin, Angelo; An impression of the Guiana wilderness..... 373
Henry, Alfred J.; Climatology of the United States..... 147
—, referred to..... 281, 509
—; Salton Sea and the rainfall of the Sohutwest 244
Herring, A. M., Bibliography relating to aerial locomotion..... 34
—, referred to..... 3
Hersey, Henry E., appointed representative of the National Geographic Society on Wellman Expedition..... 458
—, referred to..... 443
Hill, James J., cited on transportation in the United States..... 679
Hodge, Frederick W., editor of book on Indians. 483
Holmes, C. R., referred to..... 440
Holmes, Mrs C. R., referred to..... 440
Holmes, Edwin F., Expedition equipped by..... 199
Holmes, J. A., cited on coal energy..... 138
Holmes lectures, Review of Burton..... 354
Hoskins, F. E.; The rock city of Petra..... 283
Hubbard, Gardiner Greene, Memorial to, at National Geographic Society banquet..... 49
—, referred to..... 53
Hubbard medal presented to Commander Robert E. Peary, U. S. N., by President Roosevelt.. 49
Hudson Bay country, The possibilities of the.... 209
Ice barrier of the South..... 95
Ice, Fighting the Polar, Book on..... 72
Iceland, the land of fire..... 741
—, A visit to lonely..... 731
—, Interior of the island of..... 737
—, Burning sulphur beds in..... 739
Immigrants, Some of our..... 317
Immigration, South American..... 63
India, Women and children of..... 255, 259
Indians, Curtis' pictures of North American..... 469
Irrigation..... 217
—, Area brought under cultivation by..... 292
—, Colorado Desert..... 37
—, Imperial Valley..... 37
Japan, Giant spider crab of..... 280
—, Koyasan, the Japanese Valhalla..... 650
—, Women and children of..... 260, 265
Java, Women of..... 266, 267
Jennings, Governor, referred to..... 298
Jesup, Morris K., Announcement by President Moore of election to honorary membership.... 51
—, cited..... 281
—; Point of view on Arctic work..... 446
—, referred to..... 57
Jews, The Chinese..... 621
Johnston, Sir Harry, Liberia..... 334

Page

Jordan Valley and Petra 291
Jungle, Schilling's flashlights from the 534
Keely, R. N., Expedition referred to 468
Kites 1
Koch, Felix J.; Tirnova, the city of hanging gardens 632
Kunz, George F., Hubbard medal made under direction of 49
Labrador, Introducing reindeer in 686
La Gorce, J. O., Book reviews by 147, 148, 354
Langley, S. P., Bibliography of writings of, relating to aerial locomotion 28
—, Efforts to promote mechanical flight recognized by Aero Club 7
—, Experiments with aerodrome 3
—, referred to 8, 600
Largelamb, H. A.; Notes on the remarkable habits of certain turtles and lizards 412
Learmonth, N. C. L., referred to 440
Le Conte, Joseph N., referred to 213
Lee, Hon. Joseph, Beautiful Ecuador 81
Liberia 334
Lilienthal, Otto, Bibliography relating to aerial locomotion 33
—, Gliding flights of 2
Littlehales, G. W., referred to 601
Low, A. P., Arctic expedition referred to 468
—, Report, referred to 209
Lyon, Minister, Liberia 334
Madeira, on the way to Italy; David Fairchild .. 751
Magnetic Pole, South 105
Magnetic survey of the Pacific 601
Mammoth recovered from northern Siberia 620
Manley, C. M., referred to 5
Maoris of New Zealand 198
Maps, New topographic 686
Markham, Sir Clements, referred to 447
Marvin, C. F., referred to 593
Matthes, F. E., Report on glacial sculpture of the Bighorn Mountains 356
McCurdy, Arthur W.; Factors which modify the climate of Victoria 345
McKinley, Mount 54
McKinley, William, Increased total of forest reserves 524
—, referred to 61, 429
McNeil, Hector P., referred to 21
Melville, George W., Drift cask planned by 454
Merriam, C. Hart, referred to 281
Meteorological Service summary, Canadian, referred to 348
Mexico, Agricultural resources of 517
—, The principal silver-producing country of the world 494
—, The treasure house of the world 493
Mineral products of the United States, Table showing values 129
Mississippi Basin, the garden spot of America ... 679
Moisture, Millions for 217
—, Cost of 221
—, Expected results of projects for 218
Monkeys, Mummified 805, 806
Monroe doctrine today 64
Moore, Willis L., Address of, at Geographic Society banquet 53
—; Announcement of honorary members elected by Board of Managers of National Geographic Society 51
—; Announcement of Presentation of Hubbard medal by President Roosevelt to Robert E. Peary 56
—, Committees for 1907 appointed by 216
—; History of service at Weather Bureau 593
—, referred to 281, 586
Moore, Mrs Willis L., referred to 49
Morgan, J. Pierpont, Contribution for Indian photographs 469
Morocco, Population of 615
Mosquitoes, Transmission of diseases by 431
Motor sledges in the Antarctic 214
Murray, Sir John, Honorary member of the Geographical Society of Paris 428
Nansen, Fridtjof, referred to 50, 428, 448
Nebraska, Geography of 148
Newcomb, Prof. Simon, Article for McClure's Magazine, referred to 11
Newell, F. H., Appointed Director of U. S. Reclamation Service 425

Page

New Guinea; A. E. Pratt 559
New Zealand, Maoris of 198
North America, Indians of 469
—, Introducing reindeer into Labrador 686
—, The Sierra Nevada 213
—, The top of 54
North, farthest, Explorers who have reached 50
Noyes, Perley H.; A visit to lonely Iceland 731
Oil City, Pennsylvania, Oil well at 348
Oklahoma, A flock of Angora goats 35
Ore-boat unloaders 343
Oysters on Pacific coast, Atlantic 394
Pacific Ocean, Work of the magnetic survey yacht "Galilee" in the 601
Palmer, N. B.; Discovery of the Antarctic Continent 113
Papua, Strange sights in far-away 559
Paramaribo. Picturesque 365
Parker, E. W., Diagram showing coal consumption 137
Parker, H. C., referred to 54
Pearson, J. C., referred to 607
Peary Arctic Club referred to 57, 446
Peary, Robert E., Acknowledgment to address of Italian ambassador 50
—, Aided in Polar Expedition by National Geographic Society 281
—, Honorary Member of Geographical Society of Paris 428
—, Honors to 49
—, Nearest the Pole 446
—, referred to 455
—, Reply to address of President Roosevelt 57
—, Series of Arctic expeditions 468
—, To try again 281
Peary, Mrs Robert E., referred to 49, 50
Peary's twenty years' service in the Arctics 451
Penck, Albrecht, Honorary member of the Geographical Society of Paris 428
Pepper, Charles M., cited 275
Perdicaris, Ion, referred to 615
Persia, Past and present 91
Peters, W. J., commander of magnetic survey expedition 607
—, referred to 72
Peterson, George, referred to 607
Petra, The rock city 283
Philippines aided by United States 429
Photography, Polar 140
Physiography, Teaching 353
Planches, Baron, Mayor de, Address by 50
Porter, Russell W., referred to 54, 72
Porto Rico aided by United States 429
Powell, John W., referred to 425
Pratt, A. E.; Strange sights in far-away Papua .. 559
Randolph, Epes, referred to 44
Ransdell, Joseph E., Speech on potential river highways cited 681
Ray, P. H., Expedition referred to 458
Reclamation, A national act 217
— Service, An account of the work of the 217
— —, referred to 293
Reindeer in Labrador, Introducing 686
— —, Alaska 686
Reptile book, The 413
River highways of America, Potential 681
Rockwood, C. R., Project of 37
Roosevelt, President, Address by 56
— at banquet of National Geographic Society 49
—, Author of "Foreword" of book of Indians 483
—, Message to Congress cited 71
—, Presents Hubbard medal to Robert E. Peary. 49
—, Trout named for 393
Root, Elihu; An awakened continent to the south of us 61
—, cited 309
—, referred to 91
Russia, Revolution in, chaotic imperial government 303
—, Douma 305, 316
—, Peasants' need of land in 302
Salton Sea, Attempt to regain control of 43
—, How soon will the lake dry up 44
—, Irrigation company responsible for break 37
Salton Sea and the rainfall of the Southwest 244
Salton Sink 36
San Francisco earthquake, Echoes of the 351
Santos Dumont referred to 1, 2, 7, 155

Page

Sargent, F. P., referred to..... 317, 640
Schley, W. S., Arctic expedition referred to.... 468
Scidmore, Eliza R.; Archæology in the air..... 151
—; The bathing and burning ghats of Benares.. 118
—; Koyasan, The Japanese Valhalla..... 650
—; Women and children of the East..... 249
Schilling, C. G.; Flashlights from the jungle.... 534
Sciences, National Academy of, referred to..... 523
Scott, Robert F., South Polar discoveries by..... 95
Shackelton, E. H., South Polar expedition of... 214
Siam, Women and children of..... 270, 271
Sibert, William L., on cost of transportation of freight by water..... 683
Smith, George Otis, Appointed Director of the Geological Survey 425
Smith, Herbert A., Saving the forests..... 519
Smith, Hugh M.; Our fish immigrants..... 385
South America, Area of..... 62
—, Bolivia, A country without a debt..... 573
—, Chimborazo 82
—, Ecuador, Beautiful..... 81
—, Exports and imports..... 62
—, Future of..... 583
—, Guiana wilderness 373
—, Immigration 63
—, Material resources complimentary to the United States 63
—, A newly awakened continent..... 62
—, Picturesque Paramaribo 365
South, Marvelous prosperity of the..... 685
Sowers, Z. T., referred to..... 607
Spitzbergen 455
Sponges 399
Statistics of the principal countries of the world, Commercial and financial..... 420
Stearns, R. E. C.; Echoes of the San Francisco earthquake 351
Stein, Robert, Arctic expedition referred to.... 468
Stockton, Charles, Arctic expedition referred to. 459
Stolypin, Premier 313
Stone, Livingston, referred to..... 390
Storm and flood, Our heralds of..... 586
Swamp lands, Reclaiming, diagram of swamp areas 293, 299
Taft, William H.; Some recent instances of national altruism 429
Tetrahedral tower, Alexander Graham Bell's..... 672
Topographic maps, New..... 353
Trade, President Roosevelt cited on..... 71
—, South America 65
Transportation between Panama and Ecuador.... 82
— between South America and other countries... 67
Travel in curious corners of the world, Queer methods of 687
—, Comparative carrying power of beasts of burden 688
—, Single rail railway..... 697
—, Auto-trucks 710
Turn, M., referred to..... 381
Turtles and lizards, Remarkable habits of..... 413
United States and South America..... 63
—, Aid to Cuba..... 429
—, Area brought under cultivation by irrigation.. 292
—, Bighorn Mountains 355
—, Capitalized value of the national forests..... 526
—, Climatology of the..... 147
—, Coal reserves of the..... 129, 139
—, Colorado Desert, Irrigation of..... 37, 147
—, Commerce in Sault Sainte Marie Canal..... 682
—, Decisions of Geographic Board..... 216
—, Department of Commerce and Labor, referred to 334
—, Everglades, Florida 300

Page

United States exports to Central America..... 278
—, Fish immigrants 385
—, Forest Service 142
—, Geological Survey..... 353, 527
—, Government profit on foreign mail service.. 71
—, The great natural bridges of Utah..... 199
—, Helping the farmers..... 746, 781
—, Important measure before 59th Congress.... 70
—, Introduction of Philippine sugar..... 436
—, Material history of the..... 422
—, Merchants and producers in South America.. 65
—, Millions for moisture..... 217
—, Mineral products of the..... 129
—, Monroe doctrine today..... 64
—, National alturism, Cuba..... 429
— — —, Porto Rico..... 432
— — —, Philippines..... 434
— Navy, Toast to..... 51
—, New role of..... 61
—, Oil well..... 348
—, Oklahoma, a flock of Angora goats..... 35
—, One-third mapped in detail..... 293
—, Our fish immigrants..... 385
—, Our heralds of storm and flood..... 586
—, Planting fishes in the ocean..... 715
—, Result of three centuries on people of..... 61
—, Salton Sea..... 37
—, San Francisco earthquake, Echoes of the.... 351
—, Saving the forests..... 519
—, Some of our immigrants..... 317
—, Swamp lands..... 292
—, Table showing commerce with Central and South America 278
—, Trade with Cuba, Philippines, and Porto Rico 437
—, War Department interests in flying-machine experiments 5
— Weather Bureau, Active in saving life and property 586
— —, Summary referred to..... 348
—, Work of the magnetic survey yacht "Galilee" in the Pacific Ocean 601
Valhalla, The Japanese 650
Vedoe, Assistant Engineer, referred to..... 73
Volcano Lake 41
Walcott, Charles D., Elected Secretary of the Smithsonian Institution 425
Wallace, Alfred Russell, referred to..... 381
Water route from Chicago to the Gulf, The deep. 679
Water-way system of Germany..... 683
Weather Bureau, Active in saving life and property 586
—, Kites of..... 785
—, Report of Chief of, referred to..... 348
Weather folklore and weather signs, Book on.... 594
Wellman, Walter, Expedition in airship..... 457
—, Expedition to Franz Josef Land, referred to. 468
Wendle, Joseph, Hunting the grizzly in British Columbia 612
West, Farthest 447
White, Stewart E., referred to..... 393
Wilde, George F., Arctic expedition referred to.. 468
Wilkes, Charles, Discoverer of Antarctic Continent 113
Willis, Bailey, referred to..... 640
Wilson, Herbert M.; Reclaimining the swamp lands 292
Wilson, James; The modern alchemist..... 781
Wilson, John M., referred to..... 281
Winchell, N. H.; Origin of the Word "Canada". 215
Wolves 145
Women and children of the East..... 248
Wright, Orville, referred to..... 7
Wright, Wilbur, referred to..... 7
Yakima Valley 230

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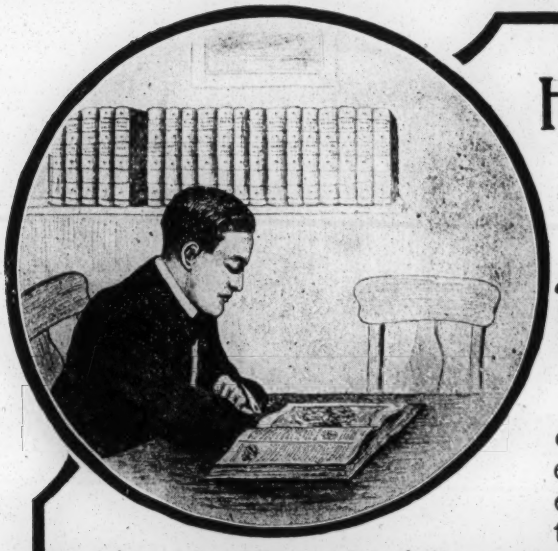

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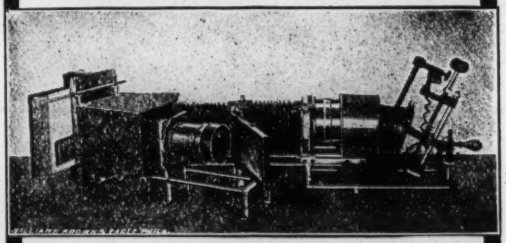

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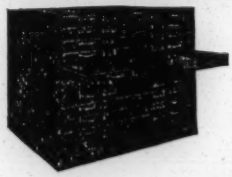

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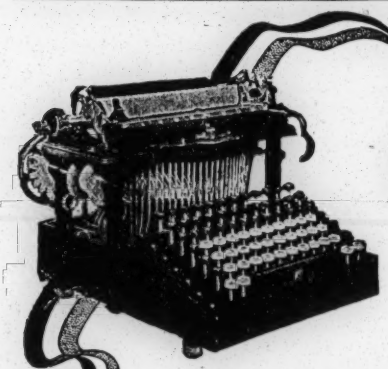

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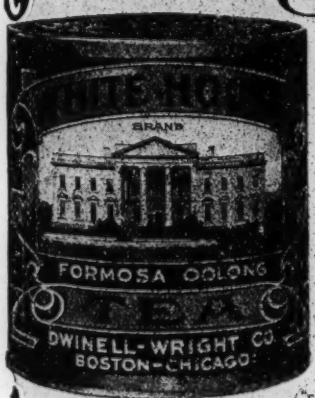

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CONTENTS

	Page
Aerial Locomotion: with a few notes of progress in the construction of an aërodrome by ALEXANDER GRAHAM BELL	1
Angora Goats	35
The New Inland Sea; by ARTHUR P. DAVIS, Assistant Chief Engineer, U. S. Reclamation Service	37
Honors to Peary: an account of the presentation of the Hubbard Medal to Commander Robert E. Peary, U. S. Navy, by President Roosevelt	49
An Awakened Continent to the South of Us; by Hon. ELIHU ROOT, Secretary of State	61
Fighting the Polar Ice	72
Geographic Literature	75
Flashlights in the Jungle (C. G. Schillings)	75
The Uncompahgre Valley and the Gunnison Tunnel (Barton W. Marsh)	78
National Geographic Society	78
Beautiful Ecuador; by Hon. JOSEPH LEE, U. S. Minister to Ecuador	81
Persia—Past and Present	91
An Ice-wrapped Continent	95
The Bathing and Burning Ghats at Benares; by ELIZA R. SCIDMORE, Foreign Secretary of the National Geographic Society	118
How Long will the Coal Reserves of the United States Last? by MARIUS R. CAMPBELL	129
Efforts to Obtain Greater Energy from Coal	138
Polar Photography; by ANTHONY FIALA	140
Notes on the Forest Service	142
Wolves	145
Geographic Literature	147
"Climatology of the United States" (A. J. Henry)	147
"The Wonders of the Colorado Desert" (George Wharton James)	147
"Romantic Cities of Provence" (Mona Caird)	147
"The Heart of England" (Edward Thomas)	147
"Geography of Nebraska" (George Everet Condra)	148
"Touraine" (Anne MacDonald)	148
"A Cruise Across Europe" (Donald Maxwell)	148
National Geographic Society	148
Archæology in the Air; by ELIZA R. SCIDMORE	151
Railway Routes in Alaska; by ALFRED H. BROOKS, Geologist in Charge of Alaskan Division, U. S. Geological Survey	165
The Maoris of New Zealand; by GILBERT H. GROSVENOR	198
The Great Natural Bridges of Utah	199
A Recent Report from the "Doubtful Island Region;" by JAMES D. HAGUE	205
The Possibilities of the Hudson Bay Country	209
The High Sierra	213
Motor Sledges in the Antarctic	214
Origin of the Word "Canada"	215
Book Review: "Camp Fires in the Canadian Rockies" (William T. Hornaday)	215
Decisions of the United States Geographic Board	216
Committees of 1907	216
Millions for Moisture: an account of the work of the Reclamation Service; by C. J. BLANCHARD, Statistician, U. S. Reclamation Service	217
Salton Sea and the Rainfall of the Southwest; by ALFRED J. HENRY, Professor of Meteorology, U. S. Weather Bureau	244

	Page
Women and Children of the East	248
Notes on Central America	272
The Giant Spider Crab from Japan	280
Peary to Try Again	281
International Flat Globe and Geographical History	281
The Rock City of Petra; by FRANKLIN E. HOSKINS	283
Reclaiming the Swamp Lands of the United States; by HERBERT WILSON, U. S. Geological Survey	292
The Revolution in Russia; by WILLIAM ELEROY CURTIS	302
Some of Our Immigrants; by GILBERT H. GROSVENOR	317
The Black Republic—Liberia; by Sir HARRY JOHNSTON and U. S. Minister LYON, of Monrovia	334
Ore-boat Unloaders	343
Factors which Modify the Climate of Victoria; by ARTHUR W. MCCURDY	345
Scenes from Every Land	348
Photograph of Oil Well near Oil City, Pennsylvania	348
Echoes of the San Francisco Earthquake; by ROBERT E. C. STEARNS	351
For Teaching Physiography	353
New Topographic Maps	353
Geographic Literature	354
"Two Years among the New Guinea Cannibals" (A. E. Pratt)	354
The Burton Holmes Lectures (E. Burton Holmes)	354
Bighorn Mountains; by N. H. DARTON, of the U. S. Geological Survey	355
Picturesque Paramaribo; by HARRIET CHALMERS ADAMS	365
An Impression of the Guiana Wilderness; by Professor ANGELO HEILPRIN, of Yale University, and Editor of Lippincott's "Gazetteer"	373
Our Fish Immigrants; by HUGH M. SMITH, Deputy U. S. Commissioner of Fisheries	385
Fishes that Build Nests and Take Care of Their Young	400
Notes on the Remarkable Habits of Certain Turtles and Lizards; by H. A. LARGELAMB.	413
Commercial and Financial Statistics of the Principal Countries of the World; by O. P. AUSTIN, Chief of the Bureau of Statistics	420
Useful Facts about the Countries of the World	424
Four Prominent Geographers	425
Notes	428
Map of the North Pole Regions	Supplement
Some Recent Instances of National Altruism; by Hon. WILLIAM H. TAFT, Secretary of War	429
Seventy-five Days in the Arctics; by MAX FLEISCHMAN, Life Member of the National Geographic Society	439
Nearest the Pole: Substance of an address to the National Geographic Society by ROBERT E. PEARY	446
Peary's Twenty-years' Service in the Arctics	451
Map of the North Polar Regions	454
No Man's Land—Spitzbergen	455
Arctic Expeditions Commanded by Americans	458
North American Indians	469
The East Indian in the New World; by HARRIET CHALMERS ADAMS	485
Geographical Congress	491
Mexico—The Treasure House of the World; by N. H. DARTON, Geologist of the U. S. Geological Survey	493
Saving the Forests; by HERBERT A. SMITH, Editor of the Forest Service	519
Flashlights from the Jungle—A Few Notes and Illustrations from a Remarkable Book by C. G. SCHILLINGS	534
Saint Stephen's Fête in Budapest; by DE WITT CLINTON FALLS	548
Strange Sights in Far-away Papua; by A. E. PRATT	559

Page

Bolivia—A Country Without a Debt; by Señor Y. CALDERON, Minister from Bolivia to the United States 573
Our Heralds of Storm and Flood; by GILBERT H. GROSVENOR 586
The Work in the Pacific Ocean of the Magnetic Survey Yacht *Galilee;* by L. A. BAUER, Director, Department Terrestrial Magnetism 601
Hunting the Grizzly in British Columbia; JOSEPH WENDLE 612
Scenes from North Africa 615
A Strange and Remarkable Beast 620
The Chinese Jews; by OLIVER BAINBRIDGE 621
Tirnova, the City of Hanging Gardens; by FELIX J. KOCH 632
Geologists in China 640
Map of Africa 640
Koyasan, the Japanese Valhalla; by ELIZA R. SCIDMORE 650
An Experimental Boat of Dr. Alexander Graham Bell, driven by Aerial Propellers 671
Dr. Bell's Tetrahedral Tower 672
The Deep-water Route from Chicago to the Gulf; by GILBERT H. GROSVENOR 679
The Marvelous Prosperity of the South 685
New Topographic Maps 686
Introducing Reindeer into Labrador 686
Queer Methods of Travel in Curious Corners of the World; by O. P. AUSTIN, Chief of the U. S. Bureau of Statistics 687
Planting Fishes in the Ocean; by GEORGE M. BOWERS, U. S. Commissioner of Fish and Fisheries 715
Hunting Big Game in Portuguese East Africa 723
A Visit to Lonely Iceland; by PERLEY H. NOYES 731
The Land of Fire; by JON STEFANSSON 741
Scenes from Every Land 744
Photographic Collections 744
Helping the Farmers 746
National Geographic Society 746
Madeira—On the Way to Italy; by DAVID FAIRCHILD 751
A Simple Method of Proving that the World Is Round; by ROBERT MARSHALL BROWN 771
The Modern Alchemist; by JAMES WILSON, Secretary of Agriculture 781
Helping the Filipino Fisheries 795
The Anglo-American Polar Expedition 796
The Use of Nuts as Food 800
American Explorations in Egypt 801
The Truth about the Congo 811
Geographical Books of 1907 813
Proposed Change in the By-Laws of the National Geographic Society 825
Imagination and Geography 830

ILLUSTRATIONS

	Page
Lilienthal gliding machine as reproduced in America for Chanute by Herring	2
Gliding through the air on Chanute's multiple-winged glider	3
Langley's aërodrome No. 5 in flight, May 6, 1896	4
The accident to Langley's aërodrome	6
Starting a flight	8
A high glide	8
Soaring	9
Landing	9
Unit cell having the form of the regular tetrahedron	12
A. Single-winged cell. B. Four-celled kite. C. Sixteen-celled kite. D. Sixty-four-celled kite	13
Sixty-four-celled tetrahedral kite flying from the flag-pole	14
Carrying the "Frost King" onto the testing ground	15
Side view of the "Frost King," showing how closely the cells are massed together	16
The "Frost King" in the air flying in a ten-mile breeze and supporting a man on the flying rope	17
1. Two 16-celled tetrahedral kites. 2, 3, 4. Oionos kite with fixed tail. 2. Front view. 3. Bottom view. 4. Top view	19
Method of flying the Oionos kite	20
Oionos kite with movable tail controlled by swinging head-load of lead	20
Oionos kite in the air	21
Kite "Siamese Twins" seen from the front	22
Kite "Siamese Twins" seen from the rear, looking inside kite	23
Side view of "Mabel II"	24
"Mabel II" outlined against sky, showing bird-wing effect	24
A floating kite, adapted to be towed out of the water	25
"The Ugly Duckling"	26
Some of the balloons which took part in the great race for the Gordon Bennett Cup	29
The French Military dirigible, "Patrie," in flight	30
The new Deutsch airship "Ville de Paris"	30
Count Von Zeppelin's airship—the largest and fastest thus far constructed	31
Santos-Dumont's aëroplane	32
The aëroplane making its first successful free flight with its owner in control	32
A flock of Angora goats in our new state, Oklahoma	35
The great new lake rising in the Salton Sink	36
A section of the Imperial Valley which was at first inundated and then left high and dry by the deepening channel	39
The way in which acres and acres of fine farm lands are undermined and washed into the New River channel	40
Cutting work of the New River	45
The great Salton Sea, 205 feet below sea-level at this point	46
A few months ago this was fertile land cultivated by prosperous people. Looking down New River canyon	47
The Hubbard Medal of the National Geographic Society, the first award of which was made to Commander Peary December 15, 1906	48
"We crossed the Arctic Circle"	73
Hauling the carcass of a Polar bear aboard the ship	74
"Louise"	75

Page

Crossing a lead in the channel ice ... 76
The pony column crossing Rudolph Island glacier ... 76
"We seemed to be in an immense river of broken ice" ... 77
Gathering cacao pods, Ecuador ... 80
Drying cacao beans in the sun ... 83
Water-carrier ... 85
Making sun-baked bricks in the Andes ... 86
Street scene in Quito ... 89
The San Francisco Cathedral, Quito ... 89
Llamas and their driver, a native Indian of Inca descent ... 90
Rock-hewn fire altar, Persepolis ... 92
The tomb of Xerxes ... 92
Subject nations bringing tribute to Xerxes ... 93
A rock panel below the tombs of Darius and Xerxes ... 93
The domed roofs of Kashan ... 94
A typical group of Mullahs and Seids ... 94
The great ice barrier, Antarctic continent ... 96
The highest ice wall seen (about 280 feet in height) ... 97
Another portion of the ice barrier, showing how it wastes away ... 98
Examining the ice barrier from a balloon ... 99
A view of the ice barrier, looking down from a balloon ... 100
Dog team on the march ... 101
The chasm which prevented Captain Scott from reaching land at the end of his 400-mile march up the ice barrier ... 102
A view of Erebus from the South ... 103
Advancing over the great inland plateau ... 104
A pressure ridge along the coast ... 107
A wandering albatross caught on the voyage south ... 108
Endeavoring to free the ship by blowing up the ice ... 108
Ice formed on submerged rope ... 109
The hunter waiting for a seal to come up to breathe ... 109
Ice flowers ... 110
The south side of a glacier ... 111
The Aurora Australis ... 112
Outline map of South Polar regions ... 114
Representatives of invertebrate zoölogy ... 115
A rookery of Emperor Penguins ... 116
Emperor Penguin and chick ... 117
Morning strollers on the river bank, Benares ... 119
The burning ghat at Benares ... 120
Cremation in progress, and Domris washing human ashes at water's edge ... 121
The bathing ghats along the Ganges, Benares ... 122
A bathing ghat ... 124
The woman's ghat at Benares ... 125
Dhobie ghat—the public laundry ... 126
Diagram showing the output of the principal coal-producing nations ... 130
Diagram showing the progressive change in composition of lignite, bituminous, and anthracite ... 131
Coal output of principal coal-producing states ... 132
Diagram showing the coal areas of the various states ... 133
Outline map showing coal areas of the United States ... 135
Diagram showing the increasing rate of consumption of coal in the United States ... 137
Sand spreading over fertile soil, Catawba River lowlands ... 143
Appalachian mountain field completely ruined by erosion ... 143

Page

Cypress and eucalyptus lining an irrigating ditch, forming a windbreak, Southern California 144
Persian cats in Hamadan 146
Nine wolf pups in front of their den 146
The Sigiri rock in Ceylon 150
Country carts, Ceylon 153
Picking tea 154
Village bazaar on the road to Sigiri 156
The Arab baby 157
The village pottery 157
The archæologist in the air 158
Climbing to Sigiri's summit 158
The king's throne on Sigiri 161
View from Sigiri's summit 161
Artist copying frescoes on the rock wall 163
Map of Alaska, showing navigable waters and railroads 164
Map of Alaska, showing, so far as is known, the distribution of metamorphic rocks and the localities where gold has been mined 168
Copper-bearing areas of Alaska, so far as known 169
Map of Alaska showing the distribution of the coal-bearing rocks so far as known 170
Map of Alaska, showing distribution of timber 172
Annual productoin of gold in Alaska since 1880 175
Geographic provinces of northwestern North America 176
Topographic reconnaissance map from Controller Bay to Prince William Sound 178
Generalized profiles of proposed railway routes 179
Map of Alaska showing railway routes and known occurrences of economically important minerals 181
Camp on bank of Copper River, showing character of timber 183
Potato patch at Baker Hot Springs, Tanana Valley 183
Mount Perouse and glacier 184
Mentasta Pass, on the railway route from Copper River to the Yukon 184
Copper River Valley at Copper Center 187
Freight steamer and barges on the Yukon River 187
White Horse, inland terminal of the White Pass and Yukon railway 188
The interior plateau region of Alaska 189
Miles glacier, Copper River 190
A Maori girl, New Zealand 191
The chief of one of the most celebrated Maori tribes, showing their remarkable tatooing 192
A Maori mother and child 193
A Maori hut 194
A group of Maori girls, Maori carving in the background 195
Two Maoris saluting 196
The daughter of a Maori girl and white man 197
Maoris practising the old war dance 198
The Augusta bridge; the greatest natural bridge in the world 200
Caroline bridge; the longest natural span in the world 201
The Edwin bridge 202
Map showing relative position of Doubtful Islands region, the Hawaiian Islands, and the American coast 206
Map showing assigned positions of reported islands in the doubtful region, and the sailing tracks of vessels sent to seek them 207
The interior of an Esquimo snow house 210
The goat at ease 211
Tehipite Canyon 212
Power Canal on the Salt River project; in Arizona 219

Page

Building the foundation of the Roosevelt Dam in Arizona 220
A noted Apache chief employed on the Salt River project 222
Concrete flume to carry water across the Pecos River, Carlsbad project, New Mexico .. 223
The Diversion Channel Dam, Minidoka project, Idaho 224
A tunnel on the government road to the Shoshone Dam 226
The Barker Brick Company, Heyburn, Idaho 227
Timbering in the west end of the Gunnison Tunnel 228
The newly constructed government road up the Gunnison Canyon 229
An orange orchard at Riverside, California, the product of private irrigation 231
A field of barley in the Yuma Valley, Arizona 232
Before irrigation—the sage brush desert, Yakima Valley 235
After irrigation—the same land valued at $500 per acre 235
A vineyard in the Yakima Valley 236
First cutting of alfalfa on reclaimed land 237
Cornfield near Granger, Washington 238
Picking hops in the Yakima Valley 239
A peach tree on the fruit farm of J. B. Ramerman, Yakima Valley 240
Apple tree in the orchard of Warren L. Gale, in the Yakima Valley 241
A rick of apples on the farm of F. Walsen, Yakima Valley 242
The little black brother 248
Cingalese children 249
Mother and child—Ceylon 250
Tamil woman in Ceylon 251
Cingalese children 252
Little Tamil girl 253
Tamil girl's foot and ankle 254
Buying the goldfish—Japan 254
Toda mother and child 255
Street dancers—Delhi 256
Street dancers of Delhi 257
Bridegroom's palki in wedding procession at Jeypore 257
Camels in the Khyber Pass 258
A Gwalior Madonna 259
The cry of the famished, Gwalior 259
The twin babies of Nikko 260
The twin babies of Nikko 261
For the emperor's soldiers in Manchuria 262
Old age in the sunshine 262
A group of Buddhist nuns—Japan 263
The lady abbess of Hokkeji Convent, Nara 264
Feeding the storks, Okayama Castle garden 265
Javanese mother and child 266
Painting sarongs in Java 267
King and queen of Burma 268
Manchu lady and her son 269
Siamese prince in full regalia of jewels 270
Siamese woman in national dress 271
Outline map of Central America 273
Native types—Honduras 276
Mail carriers and mule train leaving the post-office, Tegucigalpa, Honduras 279
The giant spider crab from Japan 280
Gorge of the Sik or entrance to Petra 285
Pharaoh's treasury, Petra 286
Rock-hewn theatre at Petra 288
Corinthian tomb and temple 289

Page

The dier, or monastery, Petra ... 290
A road in the Dismal Swamp, North Carolina ... 294
Cypress swamps in the Dismal Swamp, North Carolina ... 295
Outline map showing swamp areas in the United States ... 298
Diagram illustrating the swamp areas of the different states ... 299
Cossack immigrants, of whom about 5,500 were admitted in 1906 ... 317
A German family of one daughter and seven sons ... 318
A Scotch family of seven daughters and four sons ... 319
Typical Russian Hebrew family ... 320
Finnish girl ... 321
Russian sisters ... 321
Alsace-Lorraine girl ... 322
Finnish family ... 322
Polish and Slovak women ... 323
Ruthenian girl ... 324
Typical Southern Italian girl ... 324
Holland children ... 325
Holland women ... 325
Typical Roumanian peasant ... 326
Roumanian shepard's family as they appeared on landing in New York ... 327
Hindoos and Parsees ... 328
Arabs ... 329
Hungarian family ... 330
Servian gypsies ... 331
Children's roof garden, Ellis Island ... 332
Excluded gypsies about to be deported ... 333
The foreign consuls at Monrovia ... 335
Two native kings, Liberia ... 335
Travelers' fountain ... 336
Village in Eastern Liberia ... 336
A Liberian family and native children ... 337
Women of the Solah tribe, Liberia ... 338
Entrance to a native town, Liberia ... 339
Dancers at a funeral, interior Liberia ... 340
Women grinding corn, Interior Liberia ... 341
Electric ore boat unloader—the Heulett type ... 344
Summer and winter isothermal lines of Victoria, B. C. ... 346
Outline map showing the situation of Victoria, B. C. ... 347
A Vigorous oil well, Oil City, Pennsylvania ... 349
Making salt in China ... 350
The Devil's post pile ... 352
Topographic map of the Cloud Peak region, summit of the Bighorn Mountains, Wyoming ... 357
Looking northwest across the great plains from the mouth of the Bighorn Canyon, Montana ... 358
Cloud Peak from the east ... 359
Cloud Peak ... 360
Crest of Bighorn Mountains—shows granite broken by frost ... 361
Looking up the canyon of Tongue River on the east side of Bighorn Mountains ... 362
Canyon of Bighorn River at the north end of the Bighorn Mountains in Montana ... 363
Canyon of North Fork of Powder River in southern portion of Bighorn Mountains ... 364
A street lined with mahogany trees in Paramaribo ... 366
Market scene—Paramaribo ... 367
Bush negroes, Dutch Guianas ... 368
Bush negroes, wife and children—wilds of Surinam ... 369

Page

A Belle of Surinam 370
Two colored girls of Surinam 371
Native Indian girls in the bush 372
Indians in a "dugout" near the mouth of the Orinoco 374
A giant three-toed sloth 375
On the banks of the Essequibo, British Guiana 377
Indian children in the wilds of Guiana 378
An Indian family of the Guianas 379
In the great South American Forest 380
Part of the oyster crop in San Francisco Bay 382
Beach on western side of San Francisco Bay 383
Preparing caviar on the Columbia River 384
A sheepswool sponge of an unusual shape 401
Humpback salmon from Alaska 402
Seining carp from a pond, Sandusky River 403
School of carp swimming against inflowing water, in pond at Port Clinton, Ohio 403
Salmon ascending a stream in search of spawning ground 404
Salmon caught in a weir—Alaska 405
Lake herring stored in a refrigerating plant 406
Aristotle's catfish on nest 407
A typical American catfish on nest 408
Nest of Bowfin, commonly known as the dogfish or mudfish 409
Floating nest of gymnarchus 409
Three-spined stickelback 410
Stickelback male rotating in his nest to make it tubular for the female 410
Nest of ten-spined stickelback 411
Diagram of the cocoon which a certain fish builds to retain moisture for itself during the dry season 412
Protopterus annectens 412
Alligator snapping turtle 414
Head of the alligator turtle 414
Plated lizard 415
Glass "snake" 415
Two-footed worm lizard 416
Heads of horned lizards 417
Regal horned lizard 418
Pacific horned lizard 418
1. Fox snake and her eggs. 2. Eggs of the corn snake. 3. Eggs of the green snake. 4. Milk snake and her eggs 419
Charles D. Walcott 426
George Otis Smith 426
Frederick Haynes Newell 427
Arthur P. Davis 427
Polar bear crossing near ice fields 439
Character of ice upon which Polar bears are hunted 441
Hunting aboard the *Laura* 441
Isle of Jan Mayen enveloped in fog 442
Houses on Jan Mayen built by Austrian Expedition in 1882 442
Robert E. Peary, U. S. Navy 459
Morris K. Jesup 460
Live bull musk-ox at close quarters—Cape Columbia 461
Typical Eskimo dog 462
Egingwah and reindeer at Cape Hubbard 463
A study in bronze 464
Akatingwah 465
An Eskimo porter 466

Page

Sledging along northermost land 466
A group of Eskimo women 467
A Zuñi girl 469
Hopiland 470
Hopi children 471
Hopi maiden 472
Sohowa Poqui—San Ildefonso girl 473
A Mohave mother 474
In the orchard—San Ildefonso 475
A Crow youth 476
At the pool, Crow 477
Apache mother and babe 478
Chedeh—Apache 479
Son of the Desert—Navaho 480
A Navaho 481
Water-carriers—Acoma 482
Sacred zebus from far-away India 485
In her working gown 486
In town for a holiday 487
Hindoos employed on a cacao estate—Trinidad 488
"Holy" men from the Far East 489
Bronze beauty—Trinidad 490
A Moqui girl of New Mexico 492
In the suburbs of Mexico City 494
Pottery vendors 495
Indian types 496
Water-carriers at the fountain—Guanajuato 498
A pulque shop 499
Organ cactus—Mexico 500
Waiting the judgment day, in the cemetery, Mexico City 501
The yucca or Spanish bayonet, native of the plains of the Ser 502
Boy drawing pulque, the common drink of Mexico 503
A Mexican señorita 504
The public laundry 506
Market scene in Colima, Mexico 507
Going after cocoanut milk 508
A Mexican señor 509
Drying coffee on a large Mexican plantation 510
Guadalupe Hidalgo 511
A girl from Yucatan 512
Tehuana Indian girl 513
Types of Mestizos (white father and Indian mother) Yucatan 514
Sacrificial stone 515
A wild agave plant—Yucatan 516
A native Maya Indian of pure blood, Yucatan 518
A nursery of bull pine seedlings two months old 520
A middle-aged forest of Norway spruce, owned by the Austrian government 521
An illustration of overgrazing 522
Cryptomeria japonica—the avenue is fifty miles long and several hundred years old ... 531
One-half of a redwood tree 532
The Glens Falls boom 533
A great bull eland 535
Two very large bull elephants in a virgin forest 536
A flashlight photograph of zebras drinking at night 537
Some specimens of Schillings' giraffe in the Mimosa woods 538
A herd of zebras and gnus 539

Page
Schillings' giraffe passing the hiding-place from which the picture was taken 540
A flashlight of a powerful and full-grown leopard, taken at midnight 541
Rhinoceroses taking a bath 542
A cow rhinoceros with its young 543
Flashlight of a maned lion 544
Flashlight of a lioness about to spring upon a donkey 545
Street scenes during Saint Stephen's Fête—Budapest 549
Hungarian peasant 552
Hungarian noblemen 553
Views of the procession 554
The procession 556
The sacred relic 556
Two New Guinea dandies 561
Curious drums of the Tugeri (Dutch New Guinea) 562
A piebald tribe 565
A spider's web as a fishing net 567
Fishing with the spider's-web net 568
New Guinea women wearing the rami, or petticoat, made of leaves 570
Mr. A. E. Pratt and some native collectors 571
Rubber gatherers in Bolivia 581
Tapping the rubber tree in Bolivia 582
Curing rubber by smoking it 584
Packing-room of a rubber house, Bolivia 585
Willis L. Moore, LL. D 587
Wreckage at Kansas City, Missouri, after the subsidence of the Kansas River flood of 1903 588
Scene in railway yard, Kansas City, after the visitation of a flood 591
A fog billow, San Francisco 592
A typical weather map 595
Cirrus clouds merging into cirro-stratus 596
Broken cumulus clouds 596
Cirro-cumulus clouds 597
Cirrus, the highest flying cloud 597
Ocean fog pouring in over the hills upon San Francisco 598
Sea fog lifting and changing to clouds, San Francisco Bay 598
The jumping characteristics of a tornado, Louisville, Kentucky 599
Buildings burst open by the explosive effect of a tornado 599
Freaks of tornadoes 600
The yacht *Galilee* at San Diego 602
Scene on board the *Galilee* while working near the equator 602
Inhabitants of Fanning Island 603
A scene on Nukahiva, Marquesas Islands 603
Natives of Fanning Island 604
Women of the Marquesas Islands 604
Native women playing cricket, Samoan Islands 606
Natives bathing at Samoan Islands 606
Fiti Fiti guard, Samoan Islands 607
A Fiji Islander 608
Scene in the Fiji Islands 609
The Observers en route to the observing station near Yokohama. View of the special observing bridge. The *Galilee* blown on the breakwater at Yokohama. View of the Scientific party taken in the cabin of the *Galilee* 610
A grizzly caught by a fallen log. A black bear trapped 613
Two grizzly bears shot by Joseph Wendle 614
Moorish girl, Morocco 616
Moorish girl, Morocco 617

Page

In the Sahara Desert ... 618
Jewish Girls of Tunis ... 619
Mammoth recovered from northern Siberia ... 620
Memorial stone discovered by Mr. Bainbridge referring to "Foreign Heaven Chapel" ... 623
Main gate of the Chinese city of Kaifengfu ... 624
Kiosh Imperial Palace, N. L. Chang, Shu Shen, and Mr. Bainbridge ... 624
Chinese waiting to see Mr Bainbridge pass along the street ... 625
Chinese Jew who told Mr Bainbridge the wonderful story of his people ... 626
Mohammedan mosque in which Mr Bainbridge discovered the Jewish ark ... 629
District Inspector Shields and the officer in charge of the escort on the site of the Guafofu ... 630
Scenes in Tirnova ... 633
Street scenes in Tirnova ... 634
1. Going to market. 2. The last of the Turks ... 637
Peasants visiting Tirnova in their garments of lavender ... 639
Cultivated terraces in Central China ... 640
Four Shensi soldiers of the Governor's Guard, Central China ... 641
Interior of temple to K'wang-sheng-ti, the great warrior of the "Three Kingdoms" (221-265 A. D.) ... 642
In canyon between Siau-wang-kien and Chiang-k'ou-shi, Shen-si ... 643
A devise erected before the gate of a Chinese city to ward off an evil dragon ... 644
In a date orchard, Biskra, Algeria ... 645
A Zanzibar maiden ... 646
In German East Africa ... 647
An unusually fruitful date palm, Tunis ... 648
A native village, German East Africa ... 649
Priest and women pilgrims to Koyasan ... 651
The images of Jezo, Benton, and Fudo ... 652
The hall of tablets at Shoji-shin-in ... 655
The treasurer and his assistants ... 655
The fireplace at Shoji-shin-in ... 656
Kobo Daishi's golden tokko: other tokkos and bells ... 656
Main avenue in cemetery, Koyasan ... 658
Another view of the main avenue of the cemetery, Koyasan ... 659
Danjiro's tomb ... 660
Image of Kwannon, the Goddess of Mercy, in the sacred grove, Koyasan ... 661
The traitor's grove ... 662
Tombs of a daimio ... 662
Image of Jizo San at the entrance of Koyasan ... 667
The head priest of one of the monasteries of Koyasan ... 668
Pictures of the "B B" ... 671
The tetrahedral cells, of which the lookout tower was constructed ... 672
Tower during construction ... 673
Tower of Dr Alexander Graham Bell, built of tetrahedral cells ... 674
Another view of Dr Bell's tower taken on the opening, August 31, 1907 ... 675
Outline map of the United States, showing waterways that probably could be made navigable for commerce ... 676
View of the Chicago drainage canal ... 677
The Chicago drainage canal at Romeo, showing the great two-mile curve ... 677
Repairing the levee at Lagrange, Mississippi ... 678
The "burro" or donkey of Spanish America ... 688
Camel wagons at Delhi, India ... 689
Scene from a wedding procession, Cairo, Egypt ... 690
The bride on her way to her new home, Cairo, Egypt ... 691
The Belgian milk wagon ... 692
Crossing a river in India on a raft of inflated bullock skins ... 693

Page

A bullock carriage used by ladies of rank, India 694
A hill country "ekka" with passenger and baggage—India 695
Conveyances in Hyderabad, India 696
Morning ride of a lady of Calcutta in her palanquin 697
A "push-push" of India 698
Carts with bamboo covers, Ceylon 699
Young men riding to a Mohammedan festival, Allahabad, India 699
Coolies in the Himalaya Mountains bringing hay to market 700
Carabaos threshing rice in the Philippines 701
Tagalog boys carrying vegetables to Manila 702
Carrying water in bamboo tubes, Philippine Islands 703
Carrying milk to Manila 704
Traveling in Luzon, Philippine Islands 705
Wheelbarrow carrying freight and passenger, Shanghai 706
Street scene in Hongkong 706
A dray seen on the streets of Shanghai 707
Transportation by man power, Yokohama 708
Reindeer carrying U. S. Mail, Alaska 710
Crossing the Thelmu River by a bridge of one rawhide rope, Uri, India 711
A carriage in Madeira, where all conveyances are sleds 712
A market camel being unloaded on a sidewalk in Cairo 713
A caravan through the desert 714
An automobile train in Australia 715
Female lobster, showing eggs attached to the swimmerets 717
Scraping the eggs from a live lobster for hatching purposes 718
George M. Bowers, U. S. Commissioner of Fisheries 719
Interior of a marine hatchery 720
Spawn-taker obtaining cod eggs from a fishing vessel 722
A typical native village in Portugese East Africa 724
Native woman pounding maize 725
A wart-hog 726
The fallen monarch 727
A fair-sized bull hippopotamus 728
Native drums 729
Traveling in pre-railway days, Portugese East Africa 730
An Icelander knitting socks 731
Great canyon of the Jokulsa 733
Ponies fording the Thjorsa 733
The gullfoss or gold fall 734
A group of Icelandic farmers and ponies 735
An Icelandic dog and puppy 735
Drying codfish 736
A schoolboy 736
Milking time 738
The town of Seydisfjord, at the head of the fjord of the same name 739
An Icelander's family 740
A farm-house and farm-yard 740
A special exhibition of the Sacred Tooth, Kandy, Ceylon 745
Effect of spraying oatfields with iron sulphate, solution for eradication of wild mustard .. 747
An intermediate type of tomato, nearly seedless 748
Large type seedless tomato 748
Corn grown on undrained field 749
Corn grown on field with tile drains 70 feet apart 749
Corn grown on field with tile drains 40 feet apart 749
The open roadstead of Funchal 752
The running car, with attendants 753

Page

A steep grade in Funchal ... 754
The carro of Madeira ... 755
Funchal, the one city of Madeira ... 756
The New Madeira ... 757
Scenery of the Grand Curral ... 758
A visitor to a mountain Mission Station ... 759
Madeirans in gala dress ... 760
Madeira children ... 761
Wine press still in use on the island ... 762
Where the "Old Madeira" begins ... 763
The grapes from which the "Old Madeira" is made ... 764
Sledding a load of sugar-cane to mill ... 765
Dragon tree of the island—a century old ... 766
Cutting the cane on one of the terraced miniature sugar-cane plantations ... 767
A rest on the way home from the spring ... 768
A basket of anonas on the way to the fruit market ... 768
A typical coast village at the foot of precipitous cliffs that are terraced with plantations to their top ... 769
Peasant girls in the interior carrying sweet potatoes to market ... 770
Figure 1 ... 772
Figures 2, 3 ... 773
Figures 4, 5 ... 774
Piling sunbaked bricks in India ... 775
Indian woman and child of Guatemala ... 776
A Wallapai Indian girl of Arizona with a basket of native manufacture ... 777
Crop of onions on reclaimed salt marsh, Revere, Massachusetts ... 778
Crop of hay on diked meadow, Marshfield, Massachusetts ... 778
Scotch and white pine, 5 years old, in the Lake Clear plantation ... 779
Successful examples of planting denuded state land ... 779
Early versus late planting of cotton in the control of the Boll Weevil ... 780
California Indians pounding acorn meal for food ... 797
California Indians leaching acorns for food ... 797
Immense piles of sugar beets awaiting shipment to factory ... 798
Polish women thinning beets in the West ... 799
Power hoe ... 800
Gold necklace found by Mr Davis in the tomb of Queen Tiyi, January, 1907 ... 801
Canopic heads of Queen Tiyi and other objects found in her tomb ... 802
Head of Queen Tiyi found in her tomb by Mr Davis ... 803
The golden vulture found on head of Queen Tiyi ... 804
Mummefied monkeys and dog found by Mr Davis in the tomb of Amenhotep II ... 805
Mummefied monkeys found by Mr Davis in the tomb of Amenhotep II ... 806
Cicatrised Batetela woman (Lualaba Kassai) ... 807
Specimens of hairdressing among women of the Sango Banzyville ... 807
Native huts built of leaves (Aruwimi) ... 808
Children of the settlement school at Boma praying ... 809
Funeral at Bumba (Bangala) ... 810
English missionaries and some of their charges ... 811
The Salt Plain of Lop ... 812
Bedouin woman and child ... 814
A typical Hausa village in Nigeria ... 815
Peasants of "Little Russia" ... 817
Albanians and Bulgarians ... 818
Dogs occupy the sidewalk while people walk in the street ... 821
The Turkish butcher ... 821
Dancing girls in Borneo ... 822
A duck farm in the United States ... 823

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